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Riter-Conley Manufacturing Company

STEEL CONSTRUCTION

Pittsburgh

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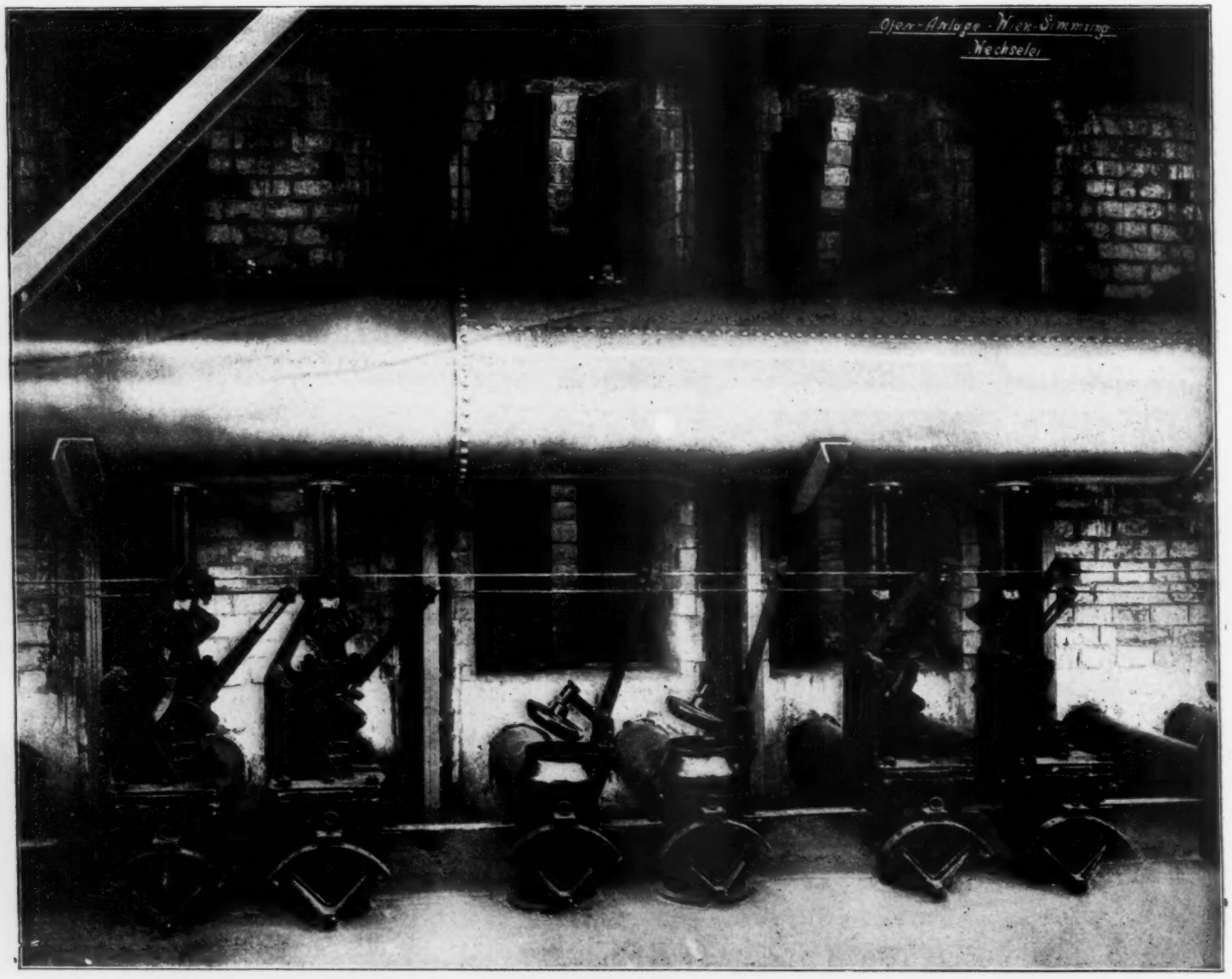
SMITHSONIAN DEPOSIT

REGENERATORS VS. RECUPERATORS.

We used to build Gas Ovens with recuperators, but the serious objections to this wasteful, inefficient method of recovering heat from the products of combustion soon led us to substitute regenerators.

If you want recuperators, we would refer you to others; but if you want to be counted among the leaders in the progress of carbonization of coal, let us demonstrate to you why we build regenerative ovens.

See our Brochures Nos. 3 and 4.



KOPPERS REGENERATORS—GAS PLANT AT VIENNA.

H. KOPPERS COMPANY,

CONSTRUCTORS OF HORIZONTAL CROSS-REGENERATIVE COKE AND GAS OVENS,

5 S. Wabash Avenue, - - - CHICAGO, ILLINOIS.

THE AMERICAN
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VOL. XCVII., No. 10. NEW YORK, SEPTEMBER 2, 1912. WHOLE NO 1,943.

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Electrolysis From Stray Electric Currents.

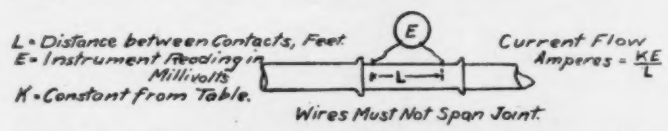
[A Lecture Delivered before the American Water Works Association at Louisville, Ky., June 6th, 1912, By ALBERT F. GANZ, M. E., Professor of Electrical Engineering, Stevens Institute Technology, Hoboken, N. J.]

Summary and Conclusions.—Experience shows that, where there is serious trouble from electrolysis caused by large stray currents leaking from street railways, the bulk of this trouble is due to defective rail bonding, to ground connections from the negative bus-bar, and to lack of return feeders to bring current back from the rails to the power station. While stray currents can only be entirely eliminated by insulating the return circuit by the use of a double trolley, either overhead or in conduit, it is nevertheless a fact, not generally appreciated, that where large stray currents exist, these can always be reduced to a small fraction of their present value by removing all ground connections of the negative bus-bar, and installing insulated return feeders proportioned for equal drop from radially disposed points in the track system located at some distance from the power station. By this method the rails are drained of current and any desired part of the voltage drop can be removed from the rails and transferred to insulated conductors from which currents cannot leak. In Europe, such radial insulated return feeders for bringing current back from the rails to the power station are made necessary by regulations limiting the allowable drop in voltage in the rails, and in most cases such installations of insulated return feeders have substantially removed serious trouble from electrolysis. This system of minimizing stray currents by means of radially disposed insulated return feeders has also been installed in a number of American cities, and the method is gradually being recognized as by far the best for minimizing stray currents. This system, in fact, removes the root of the trouble, by draining the rails of current and removing voltage drop from the rails and thus preventing substantial leakage of current through ground, and is, therefore, correct in principle. The railroad companies frequently object to this system, claiming that it is prohibitively expensive. This is certainly not the case, as is evidenced by the fact that the method is in general use in Europe and in a number of American cities to-day. The fact is that in many electric railways there is practically no installation of negative feeders, and the railroad companies are often not willing to install even a moderate amount of return feeder copper. A mistake is often made in confusing the radial insulated return feeder system with paralleling the rails with copper. Of course, where the negative bus-bar is connected to the rails at the power station, and these rails are paralleled with copper feeders, the drop in the rails is reduced in the proportion that the conductivity of the return circuit is increased, but no part of the drop is actually removed from the grounded rails. The amount of copper paralleling the rails that would be required to reduce stray currents to a negligible amount would in all large systems be absolutely prohibitive. This, however, is not the case with the radial insulated return feeder system. With the latter system any desired reduction in rail drop, and consequently in the amount of stray current that can be secured, independent of the amount of copper installed, the amount of copper being determined by the allowable drop or power loss in the return circuit. The railway company can divide the annual charge of interest on copper invested and operating expense in any ratio within wide limits without affecting the amount of stray current produced from the system. The pipe owning companies suffer constant expense on account of stray railway currents in the form of repairs and depreciation of their underground structures, and in the form of liability for accidents, and this can be reduced with certainty to any desired extent, short of complete elimination, by the assumption on the part of the railway company of expense in the form of interest and power charges for its return circuit. The railway companies should in all fairness assume this expense and responsibility. If the railway companies would apply as much engineering knowledge and money to their negative circuits as they do to their positive circuits there would be but little trouble from electrolysis. The pipe owning companies should co-operate with the railway companies by affording access to their pipes for making necessary measurements, etc. After a railway company has installed a reasonable and fair return circuit, it sometimes happens that it is desirable to eliminate any remaining current on pipes by the use of properly located insulating joints. Under these circumstances the pipe owning companies should be willing to cooperate with the railway company in the installation of such joints.

In the decree filed in the celebrated Peoria case, the railway company is enjoined and restrained from injuring the property of the water company by electric current escaping from the rails or structures of the railway company. No particular method for preventing escape of current is prescribed in the decree, because the Court in its decision has already stated that a Court does not have the power to

prescribe by injunction any specific system, and that this power resides only with legislative bodies. In its decision the Court however lays great stress upon the insulated radial return feeder system, which is spoken of as a quadrilateral system. The decree also requires the water company to co operate with the railway company to the extent of giving the railway company access to its piping system for the purpose of measuring flow of current upon its system, and of determining whether injury from electrolysis is being continued, in order that the railway company may determine whether it is complying with the terms of the decree. It is evident from this decree that the expense of providing a proper return circuit for the railway system so as to minimize escape of current falls entirely upon the railway company as it should in all fairness. One section of the decree states that within 6 months after the expiration of 1 year after the date of the decree, the railway company may apply for a hearing on the question whether it should be permitted to make an experimental use of the drainage system, in order to ascertain whether such drainage or limited use thereof can be practically applied to the piping system.

TABLE FOR DETERMINING CURRENT FLOW ON PIPING FROM MILLIVOLT DROP ALONG CONTINUOUS LENGTH OF PIPE.


L = Distance between Contacts, Feet
E = Instrument Reading in Millivolts
K = Constant from Table.
E
L
Current Flow Amperes = KE/L
Wires Must Not Span Joint.

AMERICAN WATER WORKS ASS'N STANDARD CAST IRON PIPE.
Res. 1 lb. ft = 0.00144 ohms.

Design	Nominal Size of Pipe	Wt per Foot Exclusive of Hub	Resistance per Foot Exclusive of Hub	K Current for 1 Millivolt Drop per ft. of Continuous Pipe amps.
	inches	lbs	ohms	
100 ft Head, 43 lbs. Press.	8	37.3	0.0000386	85.9
	10	51.4	0.0000280	35.7
	12	65.1	0.0000221	45.2
	14	81.4	0.0000177	56.5
	16	97.6	0.0000148	67.6
	18	115.0	0.0000125	80.0
	20	133.5	0.0000108	92.6
	24	174.3	0.0000083	120.0
	30	244.3	0.0000059	170.0
	36	328.0	0.0000050	200.0
	42	421.0	0.0000034	294.0
	48	530.0	0.0000027	371.0
	54	652.0	0.0000022	455.0
	60	781.0	0.0000018	556.0
150 ft Head, 65 lbs Press.	4	17.7	0.0000814	12.3
	6	30.5	0.0000472	21.2
	8	47.0	0.0000306	32.7
	10	65.6	0.0000218	45.7
	12	85.7	0.0000168	59.5
	14	108.5	0.0000133	75.2
	16	132.0	0.0000109	91.8
	18	159.0	0.0000091	110.0
	20	189.0	0.0000076	132.0
	24	253.0	0.0000057	175.0
	30	366.0	0.0000039	257.0
	36	501.0	0.0000029	345.0
	42	653.0	0.0000023	435.0
	48	828.0	0.0000017	589.0
	54	985.0	0.0000015	667.0
	60	1280.0	0.0000011	909.0
200 ft Head, 86 lbs Press.	4	18.2	0.0000791	12.7
	6	31.9	0.0000461	22.1
	8	48.7	0.0000296	33.9
	10	70.0	0.0000206	48.6
	12	91.1	0.0000158	63.3
	14	114.0	0.0000126	79.3
	16	140.0	0.0000103	97.1
	18	167.0	0.0000086	116.0
	20	198.0	0.0000072	139.0
	24	268.0	0.0000054	185.0
	30	396.0	0.0000036	278.0
	36	551.0	0.0000026	385.0
	42	711.0	0.0000020	500.0
	48	906.0	0.0000016	625.0
	54	1140.0	0.0000013	769.0
	60	1360.0	0.0000010	936.0
250 ft Head, 109 lbs Press.	4	29.1	0.0000492	20.2
	6	44.3	0.0000313	30.8
	8	62.3	0.0000231	43.3
	10	80.6	0.0000179	55.8
	12	101.0	0.0000143	70.0
	14	123.0	0.0000117	85.5
	16	147.0	0.0000098	102.0
	18	174.0	0.0000083	121.0
	20	232.0	0.0000062	161.0
	24	333.0	0.0000043	233.0
	30	456.0	0.0000032	313.0
	36	595.0	0.0000024	417.0
	42	753.0	0.0000019	527.0
	48	941.0	0.0000015	667.0
	54	1152.0	0.0000013	769.0
300 ft Head, 130 lbs Press.	4	17.7	0.0000814	12.3
	6	30.5	0.0000472	21.2
	8	47.0	0.0000306	32.7
	10	65.6	0.0000218	45.7
	12	85.7	0.0000168	59.5
	14	108.5	0.0000133	75.2
	16	132.0	0.0000109	91.8
	18	159.0	0.0000091	110.0
	20	189.0	0.0000076	132.0
	24	253.0	0.0000057	175.0
	30	366.0	0.0000039	257.0
	36	501.0	0.0000029	345.0
	42	653.0	0.0000023	435.0
	48	828.0	0.0000017	589.0
	54	985.0	0.0000015	667.0
	60	1280.0	0.0000011	909.0
350 ft Head, 152 lbs Press.	4	18.2	0.0000791	12.7
	6	31.9	0.0000461	22.1
	8	48.7	0.0000296	33.9
	10	70.0	0.0000206	48.6
	12	91.1	0.0000158	63.3
	14	114.0	0.0000126	79.3
	16	140.0	0.0000103	97.1
	18	167.0	0.0000086	116.0
	20	198.0	0.0000072	139.0
	24	268.0	0.0000054	185.0
	30	396.0	0.0000036	278.0
	36	551.0	0.0000026	385.0
	42	711.0	0.0000020	500.0
	48	906.0	0.0000016	625.0
	54	1140.0	0.0000013	769.0
	60	1360.0	0.0000010	936.0

American Gas Inst. Standard Cast Iron Pipe.
Res. 1 lb. ft. = 0.00144 ohms.

Nominal Size of Pipe	Wt per Foot Exclusive of Hub	Resistance per Foot Exclusive of Hub	K Current for 1 Millivolt Drop per ft of Continuous Pipe
inches	lbs	ohms	amperes
4	17.26	0.0000835	12.0
6	27.25	0.0000529	18.9
8	38.06	0.0000379	26.4
10	51.09	0.0000282	35.5
12	67.2	0.0000214	46.8
16	102.8	0.0000140	71.5
20	139.7	0.0000103	97.2
24	186.8	0.00000772	130.
30	257.7	0.00000559	179.
36	345.1	0.0000417	240.
42	452.9	0.0000338	315
48	608.5	0.00000237	429.

Stand. Wrought Iron Pipe. Res. 1 lb ft = 0.0001811 ohms.

Nominal Size of Pipe	Wt per Foot Exclusive of Hub	Resistance per Foot Exclusive of Hub	K Current for 1 Millivolt Drop per ft of Continuous Pipe.
inch	lbs	ohms	Amps.
1/8	0.24	0.000752	1.33
1/4	0.42	0.000431	2.32
3/8	0.56	0.000324	3.09
1/2	0.84	0.000216	4.63
3/4	1.12	0.000162	6.17
1	1.67	0.000108	9.27
1 1/4	2.24	0.000081	12.4
1 1/2	2.68	0.000068	14.8
2	3.61	0.000050	19.9
2 1/2	5.74	0.000032	31.8
3	7.54	0.000024	41.7
4	10.67	0.000017	58.8
6	18.76	0.0000097	103.
8	28.18	0.0000064	156.
10	40.07	0.0000045	222.
12	49.0	0.0000037	271.

Standard Steel Pipe. Res. 1 lb ft = 0.00021 ohms.

Nominal Size of Pipe	Wt per Foot Exclusive of Hub	Resistance per Foot Exclusive of Hub	K Current for 1 Millivolt Drop per ft of Continuous Pipe Ampers
inch	lbs	ohms	
1/8	0.24	0.000873	1.15
1/4	0.42	0.000500	2.00
3/8	0.56	0.000376	2.66
1/2	0.84	0.000251	3.99
3/4	1.12	0.000188	5.32
1	1.67	0.000125	7.99
1 1/4	2.24	0.000094	10.70
1 1/2	2.68	0.000079	12.80
2	3.61	0.000058	17.20
2 1/2	5.76	0.000037	27.40
3	7.54	0.000028	35.90
4	10.67	0.000020	50.70
6	18.76	0.000011	88.80
8	28.18	0.0000074	134.0
10	40.07	0.0000052	191.0
12	49.0	0.0000043	234.0

It appears from the decision and the decree that the railway company must within 1 year improve its return circuit so as to prevent as much as possible the escape of stray electric currents from its systems. If, after this has been done, it is found that stray currents still exist on the piping system, then the railway company may apply to the Court for a hearing to determine whether the water company should be directed to permit the railway company to try a drainage system as an experiment to remove the remaining current harmlessly. A drainage system such as contemplated as a possible final measure by the Peoria decree, when properly controlled so that only small currents are drained from the pipes, does not have the objectionable and dangerous features of promiscuous bonding where large currents are made to flow on the pipes as often found in American cities, and may even be a safe final method where the soil conditions are favorable and where the underground structures are all continuous electrical conductors. It nevertheless seems to the author very unfair that any pipe owning company should be compelled by a Court order to permit an electric railway to use its pipes as a return conductor for its railway system, even to the slightest extent. If the Court does not have the power to compel the railway company to adopt any specific method for eliminating the danger from electrolysis, then it certainly should not impose any specific method upon the pipe owning companies. The latter may for example prefer to remove any small remaining stray currents by means of properly located insulating joints.

It is the author's firm conviction that such remedial measures as pipe drainage or insulating pipe joints should be used if at all only as a final measure and never until the return circuit of the railway has been improved so that only small amounts of stray current remain on the underground structures. This view appears to be entirely in accord with the Peoria decision, and is certainly in accord with the best engineering practice.

The Bronder System of Gaseous Heating for Use on Domestic Account.

By "ENGINEER."

The price of gas has been and is an important factor to both producer and consumer, in view of the large quantities required for heating, generating power and similar processes of manufacture. Should it become possible to produce a gas so low in price as to compete in the price with coal, it is self-evident that a gas meeting these requirements will prove an advantage to any community and is bound to come into general use.

When used to generate power or electricity it will do away with coal storage, the use of boilers and large engines, pumps, big smokestacks and hot exhaust pipes, avoiding the employment of licensed engineers and firemen, the hauling of ashes or clinkers, the occupying of smaller floor space and, finally, costing less than half in original installation. When used to heat houses and edifices, either in conjunction with steam or hot water, it can readily be applied to a gas heater in unison with existing coils or radiators.

Present Gas Making.—Gas furnished at present by gas companies is required by charter to have a lighting capacity of between 16 to 22 candle power—referring mainly to open flame lighting; but statistics show that at present hardly more than 8 per cent. of the output of a gas works is being used in this way, the greater quantity being burned in mantles, or in ranges for cooking, or in these devices for heating and power, but for which latter a much cheaper gas would meet all the requirements.

Present city gas is obtained by treating coal in retorts, extracting all the by-products, like ammonia, tar, etc. Part of the resultant coke is used in furnaces under the retorts, and about 60 per cent. thereof having been quenched, sized, screened and stored, is sold to the public. Another portion of the cold coke is used to produce water gas in generators, which latter is subsequently carburetted with oil and mixed with the coal gas, the mixture being then purified before going on to the holder. With this method of procedure only about 5 feet of coal gas is obtained from a pound of coal, with a heating capacity of 600 B.T.U.'s per cubic foot, resulting in a heat capacity of 3,000 B.T.U.'s per pound of coal. It is true that, by the sale of the coke, quite a revenue is obtained, but the quenching, crushing, screening, storing, delivery and handling in general reduce this revenue considerably. The retail price of 80 cents per 1,000 cubic feet does not admit of its use for power and heating in competition with coal.

The New System of Manufacture—The only element used in mak-

ing this new gas is coal and its residual coke, the only waste being ashes and clinkers. Initially about 5 cubic feet of lighting gas, having a capacity of 3,000 B.T.U. per pound of coal, is generated, the by-products extracted, the gas washed, scrubbed, purified and led into a holder. The entire residuum of coke, instead of being quenched according to the old methods, is drawn in its hot state into a generator adjacent to the retorts in which it was produced. In this generator air is forced through the coke, converting it to an incandescent state, and generating producer gas of about 140 B.T.U. capacity per cubic foot, which is used to fire the retorts in the generator house. At intervals of about 10 minutes the air-blow is stopped, and steam is forced through the coke, thereby obtaining additionally some 15 to 16 feet of water gas from the original pound of coal, with a capacity of about 340 B.T.U. for each cubic foot. This water gas is washed, scrubbed and mixed with the 5 feet of coal gas first obtained from the coal, amounting to a total of 20 cubic feet of gas per pound of coal and its coke, with a heating value of from 420 to 430 B.T.U. per cubic foot. In other words, about 8,400 B.T.U. are obtained from the 1 pound of coal and its residuum of coke, as compared with 5 cubic feet of coal gas with a total capacity of only 3,000 B.T.U.

Theoretically, 1 pound of coal contains about 13,500 B.T.U., and with the new gas 8,500 B.T.U. are obtained as an available commercial product. Part of the remaining heat units is consumed in heating the retort, in the form of producer gas, a small balance being lost by radiation, but not a particle of gas is wasted in the manufacture.

The labor required to produce the 20 cubic feet of new gas above mentioned is practically equal to the labor required to produce 5 feet of gas by the old methods, as the labor of manipulating the generator about equals the labor of manipulating the furnaces under the retorts and the quenching of the coke. The cost of purification is only about ¼ that of coal gas, because the water gas requires no purification; and with the new method is obtained 20 cubic feet of gas as compared to 5 cubic feet under the old.

To manufacture this new gas the amount of invested capital is much less than that required for the present style of plants, *the reduction* of outlay in money varying from 55 to 65 per cent. Also, the cost of distribution and maintenance is considerably reduced, because the user will consume at least 5 times the quantity of gas now used when heating houses and edifices and generating power and electricity.

Properties of the New Gas—In an open flame burner this gas develops very low lighting capacity, the flame being blue with a white fringe at the top, quite similar to that of a *natural gas flame.* In a Welsbach mantle it produces a splendid light fully equal to that afforded by ordinary city gas. It can be highly compressed without loss after expanding, doss not condense or liquify, and is not affected by heat or cold—a quality which will enable its distribution for long distances in the compressed state. The rate at which it can be profitably sold to the public is less than ½ the present price of city gas, a point of great importance, in that it is competing with coal for heating and generating power. This gas mixture system has been patented in the United States and many foreign countries, and it has been tested for heating capacity and analyzed with excellent results.

A complete manufacturing plant has been built, within easy reach in the city, and gas has been made there for the last 2 months. All gas engineers or persons interested are cordially invited to inspect the same, by applying to G. A. Bronder, 309 Broadway, New York city, who will furnish any additional information. In addition to the gas plant they will also be able to inspect at the same place a newly designed and patented heater with its temporary coils. This heater was designed, built and thoroughly tested with a view of using gas economically and with perfect safety. It can be applied either to existing coils or radiators, and to heat by means of either steam or hot water. The air required to mix and burn with the gas is taken from the outside of the building, the waste in gases led to the chimney, and the heater is closed hermetically tight, making it impossible for the gas to leak into the building or deprive the air of its oxygen.

The flow of gas in the pipe is controlled by a butterfly valve, actuated by a thermostat, and the latter, placed in the middle of the house, is acted upon by the temperature of the air in the rooms. Any desired, even temperature is thus maintained all the time, and the heater needs no attention through the whole season.

The comfort and cleanliness of this way of heating stand in great contrast to heating by coal, with its attending over-and-under-heating of the air, the dirt and dust resulting from the ashes and clinkers and the disagreeable attention which must be given the furnace.

The heater has been given a test of an entire winter, heating a detached house of 35,000 cubic feet contents, provided with 37 windows and doors. It was installed in conjunction with existing steam coils, taking in the air from the outside, and heating the same through these coils. An even temperature of 70° was maintained throughout the season and the cost of heating amounted to twice the price of coal with city gas at 80 cents per 1,000 cubic feet. With the new gas a building can be uniformly heated at a price equal to or better than with coal, current prices for same being taken as a criterion.

Power can be generated, taking about 26 cubic feet per horse power. Being a mixture of coal and water gas it has a strong odor, so that leakages are easily detected.

Comparative Heat Values and Analysis of the Old and New Gases.

The figures below show the analysis of the coal gas and the new gas mixture, also the respective heat values and the percentage of the heat value of the coal, available in commercial gas.

Coal Gas, by Analysis.			*Mixture, by Analysis.*		
Co_2 ... 2.7 pr. ct.			2.8 "		
C_2H_4 .. 5.4 "			1.3 "		
O ..... 0.3 "			0.5 "		
CO .... 6.7 "	× 342 =	2,292	30.2 "	× 342 =	10,328
H.. ...45.2 "	× 347 =	15,684	46.2 "	× 347 =	16,031
CH_4 ...33.7 "	× 1,072 =	36,126	12.1 pr. ct.	× 1,072 =	12,971
N..... 6.0 "			6.9 "		
Comb..85.6		54,102	88.5		39,330

B.T.U., by Analysis.

$$\frac{54,102}{85.6} = 632.$$

By calorimeter, 627 B.T.U.

B.T.U., by Analysis.

$$\frac{39,330}{88.5} = 444.5$$

By calorimeter, 437 B.T.U.

Heating value of new mixture as compared to coal gas:

By Analysis.

$$\frac{(M)}{(C.G)}\ \frac{444.5}{632} = 70 \text{ per cent.}$$

By Calorimeter.

$$\frac{(M)}{(C.G)}\ \frac{437}{627} = 70 \text{ per cent.}$$

The total quantity of gas derived from the coal and coke by the new process, per 100 pounds of coal, is as follows: 100 by 5 cubic feet = 500 cubic feet of coal gas. Of the 67 pounds of residual coke, about 25 per cent. (or 17 pounds) is used to heat the retorts. The quantity of producer gas derived is as follows: 17 by 84 cubic feet = 1,428 cubic feet. From the balance of the coke, water gas is produced, as follows: 50 by 30 cubic feet = 1,500 cubic feet. The total yield of gas per pound of coal, for the old and new processes, is as follows:

Coal gas, yield—5 cubic feet by 632 = 3,160 B.T.U.
Mixture, yield—20 cubic feet by 444.5 = 8,890 B.T.U.
Producer gas, yield—14 cubic feet by 140 = 1,960 B.T.U.

The percentage of heat units per pound of coal available in coal gas, is as follows, assuming 13,500 B.T.U. per pound of coal.

$$\frac{3,160}{13,500} = 23.4 \text{ per cent.}$$

Percentage of heat units per pound of coal available in the new mixture is as follows:

$$\frac{8,890}{13,500} = 66 \text{ per cent.}$$

Percentage of heat units per pound of coal available in all the gas produced by the new process, is as follows:

$$\frac{10,850}{13,500} = 80 \text{ per cent.}$$

Estimated Cost of Gas Manufacturing (New Mixture) Plant of 1,000,000 Cubic Feet Per Day.

Retort house (5 benches) with floor.....	$8,500
Coal shed (20 days) 5,000 tons.....	4,000
Purifying house with purifiers.....	5,000
3 benches of 8's; 15 feet long, with iron work.	18,000
3 generators.....	4,500
1 large scrubber and 1 small washbox.....	2,000
3 boilers, with all fittings and connections....	1,500
2 blowers with engines and connections.....	2,000

2 pumps with connections	500
Mains, valves, piping, etc	2,000
Charging and discharging machine	7,500
Coal bins, coal crushers and conveyors	10,000
One 600,000 holder, complete	50,000
	$115,500

The cost of real estate of course goes according to situation. Included in the estimates are allowances for spare bench, generator, blower, pump, etc.

Owing to the larger individual consumption expected to be attained (4 to 5 times the present quantity) amount the cost of mains, services, meters and distribution in general will hardly come to 40 per cent. of the present cost per 1,000 cubic feet.

NET COST OF MAKING 1,000,000 CUBIC FEET OF COAL GAS MIXTURE, PER DAY, DELIVERED TO HOLDER.

	Per Annum.	Per 1,000 Cubic Feet.
Coal used at $3.20 per ton	$29,200	8.00 cents
Wages gas manufacture	7,080	1.94 "
Insurance, taxes, water rates, and other expenses	2,500	0.68 "
Repairs and renewals	4,500	1.23 "
Total cost of manufacture	$43,280	11.85 "
Less sales of by-products	7,050	1.90 "
Total	$36,230	9.95 "

Wages, Manufacture.	Per Month.	Per Annum.
2 machine men	$90.00	$2,160
2 stokers	65.00	1,560
2 laborers	50.00	1,200
2 engineers	90.00	2,160
Total		$7,080

Revenue From By-Products.	Total.	Per 1,000 Cubic Feet
By sale of tar	$5,800	1.6 cents
By sale of ammonia	1,259	0.3 "
	$7,050	1.9

Coal gas of 627 B.T.U. per cubic foot would have to be produced for 14.27 cents per 1,000 cubic feet to equal the cost of this mixture.

[CONTINUED FROM PAGE 138.]

PROCEEDINGS, EIGHTH ANNUAL MEETING, IOWA DISTRICT GAS ASSOCIATION.

HELD AT LINCOLN, NEB., MAY 22 TO 24, 1912.

SECOND DAY—MORNING SESSION.

Discussion on the Runner Paper.

Mr. Borden—Mr. Runner has covered the subject very fully. To my mind it would be hard to differ with him on any essential feature. He advocates promiscuous use of 1¼-inch services; rather, I infer, he advocates the use of nothing smaller than 1¼-inch service pipe. In my experience, for ordinary services 1-inch pipe will supply all the gas desired for the ordinary dwelling. Of course, there are places where we use much larger pipes; for example, in large business blocks. In a paper read by me before this Association I dwelt upon the value of expansion joints in street main construction, and a number took exception to my views. I also felt since then that I learned a valuable lesson. I believe the value of the expansion joint has been overrated, and if we can get along without it it is, of course, a saving in construction. What sort of coke does Mr. Runner use from which he obtained the results mentioned in his paper? He claims that with the apparatus named one man can produce 100,000 cubic feet of gas per day. This is no doubt true from a theoretical standpoint; perhaps it can be done anyway, and I am not here to say it cannot, but I question whether that amount of gas could be produced, day-in and day-out, from one month to another, with the services of only one man. At Hastings we are not getting as good results. We make less gas than that amount per day on a water gas machine identical with the size of the one named by Mr. Runner, and it requires the services of 1 man per day and 1 man ½ day; that is to say, we use one gasmaker, and another man about ½ day. The other half day is spent with the fitters.

Mr. Fair—As to the quantity of gas a gasmaker can make in 24 hours, I think is determined to a large extent by the holder capacity. One man *can* make 75,000 cubic feet. At a plant with which I was formerly connected we had only 45,000 holder capacity, and if the latter had been ample, I am sure that man could have made 100,000 in a day's work. Mr. Runner has covered the subject completely. I differ with him though as to his method of tapping the mains. I was always trained to tap on top of main, using the street tee and ell. Perhaps there are advantages in his system of tapping and using two street ells on the side.

Mr. Tenney—I wish to thank Mr. Runner for the good things contained in his paper. Starting with the statement that a town of less than 5,000 population, which has not certain prospects of a steady growth, cannot support a modern gas plant. As I understand the gas business, outside of the necessary missionary work, and the question of revenue. I think an installation can be made to pay proper dividends upon the amount of the investment in a community of 1, 2, 3 or 4 thousand. If so why is not the small towns as worthy of our efforts as the larger ones. Next is the question of low pressure. To day we had a demonstration of the possibilitles of high pressure gas. There are on the market to-day high pressure lamps guaranteed to produce 50 to 60 candle power per cubic foot per hour consumption. In other words, we doubled our efficiency with high pressure without the need of any complicated appliances. For instance, I know of two towns having something over 5,000 population each. The features of each place are alike, and will compare favorably in every particular. In fact, they are not over 4 miles apart. In one of those towns, working under low pressure, the average sales per month last year were 600,000 feet; in other words, they sold 7,000,000 feet of gas during the year. The other town, operating under high pressure, system, sold last year 12,000,000 feet. The price was the same in both towns, and the service was considered practically the same. The question naturally arises "What does it cost?" In the high-pressure town the Company went out to manufacturing plants scattered along or over a radius of 3 or 4 miles from the town, and took in every one. They are getting the business and selling the gas. In the other town they were unable to do it. The only instance in which they ever supplied a manufacturing plant successfully was by putting on a pusher operation to boost the pressure, and then to give it up on account of the high cost of maintenance. This is a question of vital importance to the public and of general interest to the gas business, and it should not go from here that this paper is the standard as to the model small gas plant. A further point. It does not seem that the use of 82 or 84 pounds of fuel per 1,000 feet of gas is economical. In fact it seems very high for an output equal to that enjoyed by Mr. Runner.

Mr. Smith—We have a low pressure plant ia a town of 3,500 which is turning out 18,000,000 feet of gas per year. Mr. Runner seems to have too much of an investment for the size of the town. In a high pressure plant you have one that will turn out as much gas as he is making for half the money he has in it. The question in running a gas plant is making dividends. I have worked in high pressure and low pressure plants as long as I have been away from home and able to work, and I favor the former pressure in every respect. You can give a steady, even pressure and guarantee service. That is what counts in the gas business. I have operated a water gas plant of the same make and design as Mr. Runner's, running my blower by steam, on 13 pounds of 2-inch washed screenings per 1,000 feet of gas. By putting on an electric blower we ran on 10 pounds of 2-inch washed screenings per 1,000 feet. I am to-day compressing up to 100 pounds on 17 pounds of coal, which cost us $3.50, delivered at Grinnell. We are pumping it and compressing it into compression tanks, from there into the mains. Of course, we have the expense of gavernors, but no expense in maintaining holders. I never had a freeze-up, back pressure or low pressure to fight, and on Saturday night as high as 200 arcs are burning. A person making an investment in a town of from 3,500 up can give better service on high pressure than with twice the investment on low pressure. Will Mr. Runner explain why he uses 8-inch main, never letting any part of the system be less than 2-inch. It seems as though an engineer fitting out a distribution system should run according to the gas computer. If he can furnish gas to a town of 5,000 with an 8 inch main (say, he had 600 consumers) when he got 1,200 consumers could he furnish gas to that town; or when he had 2,400 consumers? Wouldn't there be a wide variation in the pressure in the distribution system?

He employs a solicitor practically all the year around, and probably pays him $150 a month. In addition he has a bookkeeper; but the idea is to keep the expense to the minimum. I don't know what volume of business he does, but it would seem, in a town of 5,000, after the manager gets the construction work done, he should be able to take care of all the fitters and do all the soliciting. I have run 16 fitters and did all the soliciting, selling as many as 14 stoves in a day and managed the plant. Yet I have never noticed any need for a solicitor.

Mr. Smith—One thing I would call attention to is the size of service pipe. Of course, I am running a high pressure plant, and in the last one I had before going to Yankton, some 300 services were put in, at least 200 of them being ¾-inch. Personally, I never put in any pipe under ¾-inch. One advantage I claim for high pressure is the small danger from freeze-ups. Last winter, when all the low pressure plants were frozen, I was around visiting them; but they didn't have time to visit with me, so I went back home. We had one freeze-up on 435 services, whereas they had about 435 freezes on one service. We have about 6½ miles of distribution, all wrought iron mains, and haven't an expansion joint. Two years ago, at Sioux City, everybody was boosting for the expansion joint. I had had some experience with them in water works construction, especially in crossing rivers. I sank them in the mud, and before they would expand they would pull my pipe in two. I couldn't see why they shouldn't do that on a gas plant; but I didn't dare say anything, for I didn't think I was sufficient authority to declare whether or not it would expand. I haven't any of them and don't have any trouble; so I don't think they are necessary. Although an ardent advocate of high pressure, I believe there is a point where high pressure ceases to be a virtue. I am striving to the end that I don't have to carry over 40 or 50 pounds. I propose to have sufficient pressure holders so as not to have to compress to 100 pounds, for, as you all know, the higher the pressure the more fuel. When you get over 60 pounds you are burning up fuel quite rapidly, so it will pay better to buy more tanks than to keep using up fuel and burning out the machinery. Mr. Runner suggests that purifiers should be cleaned every 6 months, and I haven't been able to make them run 6 months. I believe we can give better service with high pressure in our small, isolated plants than we can with low, because in South Dakota it gets cold: If you don't believe it, go up there. Last year we had about 9 months winter and 3 months cold weather, so we would have had some trouble with a low pressure plant, I think. About the only thing necessary to kill a gas plant in a small town is to get frozen up in the middle of winter and then wait for the sun to thaw you out; you won't have any business in the spring. The last and most important proposition is the question of investment. It is all right to have one nice installation of a 3-piece set; it looks well and is an ornament. But in a small town we have to run every day and 24 hours in the day; if something happens to one set it is generally very hot when it happens, and it doesn't cool off right away. We installed 2 small, low-priced generator sets, and when one gets out of service we use the other and have good success. In fact, we have yet to fail to give good service the year around.

Mr. Bertke—If by any chance have these men using high pressure (100 pounds to the square inch) ever taken the candle power?

Mr. Smith—We carry a candle power of 18, measured on the jet photometer. When I took over this plant I sent in both photometers and had them tested. The gas tested 18 after compressing to 100 pounds, using 17 pounds of coal, 45 pounds of Solvay coke and 3½ to 4 gallons of oil.

Mr. Bertke—Was the candle power taken at the outlet of the governors?

Mr. Smith—Yes, sir.

A Member—How does Mr. Runner handle the distribution of accounts under his free connection? He doesn't mention that.

Mr. Runner—In closing this discussion I would say in this case, like any other questions brought before us, much depends on local conditions with nature of population served, together with the size of the city or town under consideration; for in no two towns of like size will you find like conditions. I would not care to build and operate a gas plant in any town that would not stand the investment we have in Charles City, for when we get the business our plant and main capacity will take, we will have in use 540 gas ranges, 98 water heaters (19 of which are automatic) and 128 gas arcs installed, while the field is not fully developed as yet by any means. Our town grew rapidly in the last 2 years, in which time over 300 houses have been built; but with this we cannot afford the $150 solicitor Mr. Smith mentions. We are paying $75 a month for a new business man. We put in 1¼-inch services, and it is our practice to supply 2 houses wherever possible from 1 tap, running in along the dividing property line. We tap on the side of the main, using 2 street ells, making a swing-joint, and no blocking under the service nearer than 4 feet to the main; this gives us more cover, and when using a service clamp this puts the strain, due to the expansion and contraction of the service pipe, directly on the strap, otherwise we find, with the clamp on top of the main, this give-and-take strain will in time cause a slight leakage around the lead gasket. We charge for services and connecting all appliances, believing in a reasonable profit on gas appliances sold, as the customer will be more apt to use that in which he has some money invested. I have known gas ranges that were given away used as boxes, while free services are quite frequently not used at all. We only ran free services the first two seasons in order to get the business on quickly, and these we charged to our investment account. As to expansion joints, experience in our climate is that it pays to use them. Last winter, in the Austin (Minn.) plant, which we operate, the mains pulled apart where expansion joints were not used. And while these mains were shallow, yet in some winters the frost reaches even our deepest laid gas mains. In Charles City we did not have the slightest trouble in this respect; nor did we expect any. With our present output one man can make all the gas during the day and have time for other duties, save in the extreme winter weather, when steam is necessary on the holders, we shut up the plant nights. Based on results obtained under the present conditions, one man can make 100,000 cubic feet of gas per day of 12 hours, while, of course, we obtain greater efficiency and economy by running the water gas set more nearly up to its capacity. The coke we are using is 72-hour Pocahontas, which runs less pounds per 1,000 on gas made than either Connellsville or gas house coke. Our purifiers are 5 feet by 10 feet, circular boxes, holding about 400 bushels of oxide. We are putting 7 to 9 millions cubic feet of gas through each box before having to change the purifying material. We plan so that this work does not have to be done in the cold winter months. All our services in the business district are 2-inch, and we did not have any trouble whatever from freezeups last winter, save in one instance, where a 1¼-inch service supplied the fire station which had no basement in the building. We had experience with high pressure services, which were frozen solid so that it was necessary to dig them up; and this will be the case where high pressure mains are not properly graded. Both the high and low pressure systems have their advantages and disadvantages as regards maintenance; both have their place, and must be properly built and maintained if we give the service which is first-class. This is important if we are not to have trouble. I think the public whom we serve are entitled to the best service.

On motion of Mr. Vincent, a hearty vote of thanks was passed to Mr. Runner.

Report of Committee on President's Address.

Mr. Kellogg read the report of the Committee on President's Address, as follows:

Your Committee on President's Address is impressed by the broad and candid tone in which the President states the duties we owe to the public and to our patrons, and he perceives our right to fair treatment from the public. Candor in dealing with the authorities he considers to be the chief instrument in gaining justice for the interests we seek to guard and foster. If those we represent will give the fullest consideration to this, the central figure of the address, it will, we believe, be all the better for our Association and for the interests represented in its membership. It is high praise to say for the address it is worthy its author, and had the approval of those to whom it is delivered. Respectfully,

L. L. Kellogg,
Geo. D. Roper,
Geo. McLean,
} Committee.

On motion of Mr. Fair, the report was adopted and ordered spread upon the minutes.

Committee on Howard Obituary.

Mr. McLean, from the Committee on Resolutions, respecting the death of Mr. J. B. Howard, reported as follows:

It is well the destiny that limits the span of human life sometimes permits an extension beyond three score years-and-ten, especially when the dispensation favors one of personality so genial, helpful and lovable as that of "Uncle Jerry" B. Howard, who departed this life, April 10, 1912.

Although not enrolled in its membership, the Iowa District Gas

Association ever welcomed "Uncle Jerry" Howard to its Councils and claimed him as a brother to all the gas fraternity.

In convention assembled, we now pause to record the loss we feel in his passing. His death deprives us of one we all regarded as a helpful, inspiring friend. If our wishes prevail, his spirit has entered "The realm wherein happiness endureth forever."

GEO. MCLEAN,
R. M. PARKER,
GEO. ROPER, } Committee.

On motion of Mr. Borden the resolutions were adopted and ordered spread upon the records. The convention thereupon adjourned, to reassemble at 10 o'clock Friday morning.

THIRD DAY—MORNING SESSION.

In the opening number Mr. Weisgerber gave a very interesting description of the special selling campaigns in use at Cedar Rapids, which resulted in most phenomenal sales. A short discussion followed, participated in by Messrs. Gray, Winchell and Weisgerber.

The President introduced Mr. C. W. Lockwood, of Clinton, who read the following paper on

THE AVAILABILITY OF AMMONIA MACHINES FOR SMALL PLANTS.

We find, on consulting "Brown's Directory of American Gas Companies," there are about 20 companies in the territory covered by the Iowa District Gas Association which manufacture coal gas. The operators of some of these works, whose present output may appear too small to make it advisable to install a plant for the concentration of ammonia, may find that, in the prospect of future developments and increased output, it will be time well spent to consider with us, "The Advisability of an Ammonia Plant for Small Works."

We will consider the saving of volatile ammonia only, as all authorities on this subject are agreed that the saving of the fixed ammonia is not profitable, when handling the liquor made in small works. Ammoniacal liquor, as it enters the well, should contain about 5 pounds of ammonia per 2,000 pounds of coal carbonized; of this amount, the fixed ammonia averages from 5 to 15 per cent. and it is in the concentrating of the volatile ammonia in this liquor to a marketable strength, without loss by evaporation, or from other causes, that we are interested.

We are all more or less familiar with the form of appliance used for this purpose, as the manufacturers of concentrators are continually sending out bulletins and pamphlets describing the construction, method of operation and results obtained by the use of their apparatus. It might be well, however, to consider here what equipment is necessary for this purpose.

In the first place, scrubbers of ample capacity are very essential, and, in this connection we find that a washer, of which there are several forms on the market, is of great assistance in removing all the ammonia from the gas before it enters the purifying boxes. From the washer the liquid flows to a settling tank, where the tar and ammoniacal liquor are separated and overflow to their respective tanks. A concrete, underground well, with a tight cover to prevent evaporation, and having a capacity of from 3,000 to 5,000 gallons, is necessary to store the liquor, as the concentrator will be operated at irregular intervals. An iron tank of 10,000 gallons capacity must be provided for the concentrated liquor, as shipments of less than tank car quantities would not be advisable on account of the excessive freight rates. A small iron tank, in which the concentrated liquor of a few hours run can be stored, is also useful, to prevent the possibility of any liquor below the necessary strength going over to the storage tank.

The pump for forcing the liquor to the overhead feed tank should have connections, so that it can be used to pump the concentrated liquor from the temporary storage tank to the large one, and again from the large storage tank to tank cars for shipment. The pump must be made of cast iron throughout, to withstand the effects of the ammonia.

In some works where installation of an ammonia concentrator might be considered advisable, some part of the equipment would be already available. For instance, the scrubbers may be in perfect working condition and of ample size to take care of the removal of the ammonia from the gas, and again the tar well may be large enough, so that a partition could be built in it, making a well large enough for the storage of weak liquor, at less expense than the building of a new well.

In looking up the subject of concentrators, we found that the smallest still it is considered advisable to build or operate is 24 inches in diameter, and for use in a small works, would be for volatile ammonia only, and not equipped with the liming leg necessary for the removal of the fixed ammonia. This part of the still can be readily installed and connected to the volatile apparatus whenever the amount of liquor handled is sufficiently large to make the removal of the fixed ammonia profitable. It is advisable to have all parts of the still, and its connections, made of cast iron, thereby cutting down the maintenance cost, lead pipe being used where it is necessary to allow for expansion and contraction, and also in the cooler coils.

Having already noted what is the necessary equipment for handling this liquor, we will now consider what additional help, if any, would be required to operate the plant. As actual experience is always of more value than theory, we will offer for your consideration the operation of a plant in a works where the liquor from the gas made in 3 benches of 9's is concentrated in a 24-inch still. In addition to the coal gas made in this plant, there is made an average of about 100,000 cubic feet of water gas daily. The water gas maker has charge of the ammonia plant when it is in operation, which is usually about 3 days each week. When the weak liquor well is full the concentrator is started, and run for 3 or 4 days, or until it is almost empty, then the concentrator stands idle until the well is filled again. It was found advisable to operate the ammonia machine during the day only, as better results were arrived at by having one man, who thoroughly understood the machine, to handle it, than we could, by turning over the running of the machine to the head stoker of the night shift. This goes to prove that the operation of an ammonia plant requires the attention of a man who has more intelligence than the average stoker; one who is able to understand what are the results to be obtained, and the means of obtaining them. After this knowledge has been acquired we found very little trouble was experienced in the operation of the machine, as, after it is started in the morning, the only attention required during the day is a slight change in the volume of steam or weak liquor, the strength of the concentrated liquor being tested two or three times each hour of the day.

In almost all small works you will find at least one man capable of handling an ammonia machine in this manner, and who also can find the time to operate it at intervals (which would be governed by the size of your weak liquor well), without interfering very seriously with his other duties. A man who can handle the troubles of a coal gas plant intelligently is capable of successfully operating an ammonia machine and getting good results.

We will now consider what are the expenses connected with the installation and operation of a plant. We have already stated that the smallest concentrator it is considered advisable to install is 24 inches in diameter, which would be erected on foundations furnished by the gas company. In almost all works there is sufficient unoccupied space in one of the buildings, which can be used for that purpose. The equipment would then consist of: One 24-inch concentrator for volatile ammonia only, which will cost from $1,300 to $1,500; 1 tar and liquor separator; 1 weak liquor well to hold 5,000 gallons; 1 small tank for the storage of a few hours' make; 1 concentrated liquor tank of 10,000 gallons capacity. These, with the necessary piping for steam, water, weak and concentrated liquor, and connections to sewer will cost, ordinarily, between $700 and $900, making a total investment of about $2,200. In considering the capacity of a concentrator there is some variation in different makes, but as a general rule we find that a 24-inch still will concentrate not less than 2,000 gallons of 2° Twaddle liquor per day of 10 hours, which should give us about 130 to 140 gallons of 15 per cent. liquor for the day's run; or, figuring by the pound, about 150 to 160 pounds of ammonia. The amount of labor charged to operation would depend entirely upon whether a man devotes his entire time to the concentrator while it is in operation, or divides his time between that and other duties. In the latter case the labor cost would be a very small item, as 2 or 3 hours a day would all the time be be charged to ammonia. The steam and water used do not add much to the cost of production, steam being used at a pressure of 4 to 5 pounds, which has been estimated as requiring about 24 pounds of steam per pound of ammonia to concentrate a 2° Twaddle liquor to a liquor containing 20 per cent. ammonia. The water used in the cooling coils of the absorber, to obtain the same results, has been estimated at from 8 to 9 gallons. The manufacturers of ammonia machines usually claim that a works carbonizing from 1,500 to 2,000 tons of coal per year would find it a paying proposition to install one of their plants.

On a 2,000-ton basis we will figure the possibilities of a plant being a profitable investment. We find that, under favorable conditions, we would have about 4½ pounds of free ammonia for each ton of coal carbonized, giving us 9,000 pounds of ammonia, the market price of which is about 8 cents per pound F.O.B. destination, all contracts being made at a delivered price. The freight would average about 1 cent per pound, leaving a net price of 7 cents per pound, against which must be charged the cost of labor, steam and water, and a fair rate of interest on the investment. After taking all these things into consideration, we should have at least 4 cents per pound of ammonia, over and above all expenses connected with the manufacture; or, in other words, a saving of about 18 cents for each ton of coal carbonized.

The above figures are given to show what it is possible to do with the free ammonia in gas liquor, when everything connected with its concentration, from the scrubber to the ammonia machine, are in first class working order, and the operator of the machine is handling it to the best advantage, getting all the ammonia from the liquor that can be gotten with a volatile ammonia machine.

In conclusion, the writer wishes to acknowledge his indebtedness to The Gas Machinery Company, Cleveland, O.; John L. Unger, Chicago, Ills.; and the Michigan Ammonia Works, for some of the data used in the preparation of this paper.

Discussion.

Col. Pratt—The paper is a very interesting one to me, and demonstrates, or should demonstrate, to men who are managing coal gas works that, even in a small coal gas plant, it pays to attend to such detail as the placing in operation of an ammonia plant. I am surprised that Mr. Lockwood doesn't take more credit than 4 cents a pound for his ammonia, which reduces the cost of his coal about 18 cents a ton. I think he is very fair. To me it is an interesting paper because it proves that a works manufacturing a small quantity of coal gas could safely and economically install an ammonia plant. It is simply the difference between fair results in a works and good results by attention to details.

Mr. Lockwood—Col. Pratt spoke about the 3 cents between our estimate and the net price of the ammonia. Of course, that includes the interest on the money invested in addition to the cost of operation; and it will also allow enough for a depreciation fund, if you wish. I did not mention the word depreciation, because I know that sometimes stirs up argument.

On motion of Mr. Vincent, a hearty vote of thanks was tendered to Mr. Lockwood.

The President—We had one more report, that on Membership. Mr. Adams is not here, but I think the results of what the Committee tried to do have been shown in the attendance at this convention. Before closing the meeting I wish to say personally a few words, if you will permit me. I want to thank the gentlemen who have given me the opportunity of being their President for the last year. The sand is now running low; in but a few minutes this meeting will be past history. I shall no longer be President of this Association, but will be known as one of the Past Presidents. And while I am President of the Association and have certain powers or prerogatives, I wish to make a little statement. We have had with us a number of years a gentleman who has put his best work into the upbuilding of this Association. He has added very materially to all of our meetings; has taken part whenever he could; has been at the beck-and-call of every man. In other words, he has had his heart in the work. By virtue of my office I become the affiliation member to the American Gas Institute. I now turn over these prerogatives and privileges with the greatest pleasure to Mr. Vincent. [Applause.] And I will, therefore, ask the Secretary to communicate with the American Gas Institute, stating that he now is the affiliation member to that body, and will receive all communications from it. [Applause.]

Col. Pratt—Mr. President and Gentlemen: I always feel, at the closing of a meeting like this, at least the thanks of the members of the Association are due to those who have assisted in making the meeting a success. Only gentlemen who have served in an official capacity, or who have served on committees, and know themselves the volume of work incident to the preparation and conduct of a meeting of this kind, can fully appreciate the work that is necessary. The highest compliment, I think, that can be made to a presiding officer and to his assistants, is the attendance upon the different sessions of the meeting. But I have arisen to make mention of the work of the officers of this Association, the presiding officer and the Secretary; also the working committees, especially the Committee of Arrangements from the Lincoln Gas and Electric Company. I see, too, the press of this city has been very kind in reporting these meetings. I take great pleasure in moving, Mr. President, that the thanks of the Association be extended to you and your assistants, and to those who have assisted in any way in making this meeting a success. I will put the motion, if you like.

[Motion submitted by Col. Pratt and carried unanimously by rising vote.]

The President—Just a word. It is hard to give up, although knowing that the pulse is running low. My heartbeats in the last year have been for this Association, and though I step down and out now into the ranks as a private, you can rest assured that I at all times will be ready to give the best that is in me for the upbuilding and advancement of the Iowa District Gas Association. One of the first laws in the gas industry that has been mine—and I pride myself upon it—is that I never gave up old friends for new. The old friends who stood by you in probably the darkest days of your life, who have ever held forth the hand of friendship, cannot be forgotten by such as I; and it is the old friends, together with the new, whom I thank most heartily for the very kind attention you have given me since I have been here this week. Gentlemen, we shall probably never meet again in the same position—I as President and you as active and associate members; but as the years roll on some of you will occupy the rostrum, and I promise when that time comes I will give you the attention that you have given me, for I believe thoroughly in doing unto others as you would have them do unto you. [Applause. Adjourned.]

PROCEEDINGS, ELEVENTH ANNUAL CONVENTION, WISCONSIN GAS ASSOCIATION.

HELD IN THE HOTEL PFISTER, MILWAUKEE, WIS., MAY 15TH AND 16TH, 1912.

FIRST DAY—MORNING SESSION.

The President called the meeting to order at 10 A.M., remarking they all must be pleased with the large attendance, and hoped they would be benefited by the proceedings. The minutes of the last meeting were adopted as printed, and the Secretary read the following report from the

EXECUTIVE COMMITTEE.

MILWAUKEE, WIS., May 15, 1912.

To the Wisconsin Gas Association: Your Executive Committee to whom was referred all applications for membership in this Association received since the date of our last session, begs leave to report that the same were considered and are recommended for acceptance:

Active.

Blonien, E., Milwaukee.
Eisenman, A. A., Manitowoc.
Fulton, G. H., Madison.
Glahn, F., Milwaukee.
Hancock, B. L., Milwaukee.
Haertel, W. F., Milwaukee.
Kretlow, A., Milwaukee.
Lawrence, J., New York.
Luethe, J. K., Milwaukee.
Lathrop, L. H., Marinette.
Martin, J. F., Kenosha.
Sterling, E. D., Rhinelander.
Summer, O. C., Waukesha.
Smith, A., Eau Claire.
Wilson, H. H., Wausau.

Associate.

Brechtel, A. J., Minneapolis.
Curfman, F. J., St. Louis, Mo.
Connor, C. H., Milwaukee.
Dunkle, C. C., Chicago.
Harbison, C., Mercer, Pa.
Kline, H. C., Rockford, Ills.
Little, C. D., Chicago.
Quinn, W. C., Aurora, Ills.
Raymond, H. S., Chicago.
Rice, J. R., Chicago.
Strause, L. J., Philadelphia.
Ulman, A., Cleveland, O.
Wallace, A. I., Chicago.
Weadley, W.H., Kalamazoo, Mich.
Wike, W. A., Chicago.
Wysooki, J., Aurora.

Respectfully submitted,
H. M. BUCK,
J. H. WALKER,
W. H. WINSLOW,
} Committee.

ELECTION OF NEW MEMBERS.

On motion the report was accepted, the rules were ordered suspended and the Secretary instructed to cast one ballot for all the applicants for membership.

The Secretary subsequently reported that the instructions had been carried out, and the President welcomed the new members and hoped they would enter into the spirit of the meeting, giving their experiences for the mutual benefit of all.

(*Continued on page* 154.)

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NOTICE TO ADVERTISERS.

New Advertisements and changes of copy therefor should be in hand Wednesday noon of week prior to date of issue.

NEW YORK, MONDAY, SEPTEMBER 2, 1912.

[Official Notice.]

Nominating Committe, American Gas Institute.

American Gas Institute,
Office of the Secretary,
New York, Aug. 28, 1912.

The following gentlemen have been named by the Council to nominate officers for the American Gas Institute, to serve during the year 1913:

Nominating Committee.—Messrs. Wm. A. Wood, Boston, Mass. (Chairman); W. Cullen Morris, New York City; R. B. Brown, Milwaukee, Wis.; D. J. Collins, Philadelphia, Pa.; Frank W. Frueauff, New York City.

Alternates.—Messrs. C. M. Cohn, Baltimore, Md.; H. L. Rice, Aurora, Ills.; James Ferrier, Rome, Ga.; C. F. Prichard, Lynn, Mass.; Jansen Haines, Des Moines, Ia.

[Official Notice.]

First Annual Meeting, The Gas Meeters.

The Gas Meeters, Office of Secretary,
42 Pine Street, N. Y. City,
August 28, 1912.

The first annual meeting of The Gas Meeters will be held Friday, September 6th, at 4 P.M., in the new building of the Public Service Company, at Sipp avenue, Jersey City. The building is a fine example of utility and progressiveness in design. It has been built to handle new business in large quantities. After inspecting the building the members will adjourn to the "Down Town Club," 75 Montgomery street, Jersey City, where dinner ($2 per plate) will be served promptly at 6 P.M. Mr. Ormsby F. Potter will tell about "Public Service" and its 400,000 gas consumers.

Take "Hudson Tubes" to Summit avenue; the Public Service building is right at the station. Ten minutes from Cortlandt street, New York. Fraternally yours, H. Thurston Owens, Sec'y.

[Official Notice.]

Twentieth Annual Meeting, Pacific Coast Gas Association.

Pacific Coast Gas Association,
Office of the Secretary,
San Francisco, Aug. 24, 1912.

To the Members, Pacific Coast Gas Association: As the date of the Twentieth Annual Convention draws near, everything points towards this meeting surpassing all previous ones, not only in the papers to be presented, but also in all other matters pertaining to our industry. Reports from our San Diego friends reveal the fact that, aside from the business to be transacted before the convention, they have arranged for some novel entertainments for the members and their families.

All that the officers of the Association ask of the members is their co-operation, and with this there can be but one conclusion; and that is a successful meeting.

As we have already stated, our "Experience," "Wrinkle" and "Novelty" Editors have been on the keen lookout for matters of interest along their particular lines; so if our members will "unburden" themselves to the Editors of the respective departments, they will not only confer a favor upon them, but also upon the members of the Association as a whole.

In connection with our subscriptions to the "Gas Engineering Degree Fund," which in our last advice to you, under date of February 1st, 1912, amounted to $1,559, we are happy to say that at this time the fund amounts to $2,746; and for your further information we are sending herewith a corrected list of subscriptions as of April 15, 1912.

It is not at this time considered necessary or advisable to call upon members who have already subscribed toward this great work for further subscriptions; but if the members who have not as yet done so could see their way clear to pledge $5 per year each for 5 years, it would assure beyond doubt the success of this undertaking. Subscription blanks may be had upon application to this office.

Don't forget that new life in the Association is essential at all times, and if among your friends or acquaintances there are any who are eligible for membership, point out to them the advantages to be gained by their being associated with us; and, with this end in view, application blanks may be had upon request.

Remember the time (September 17, 18 and 19), and place (San Diego, Cal.), and arrange your plans to be with us.

Yours very truly, John A. Britton, Sec'y.

[Official Notice.]

Fall Meeting, New Jersey State Gas Association.

New Jersey State Gas Association,
Office of Secretary,
Belmar, N. J., August 26, 1912.

The fall meeting of the New Jersey State Gas Association will be held at Atlantic City, N. J., at the office of the Atlantic City Gas Company, Saturday, September 21st, 1912, at 1:30 P.M. Train from New York leaves Pennsylvania station at 10:12 A.M. The meeting will be devoted to lighting. The subject of high pressure will be covered by Mr. George S. Barrows and Mr. R. N. Zeek. Mr. Will W. Barnes will speak on "The Rejuvenation of Gas Fixtures."

Manufacturers who are members of the Association have been asked to exhibit the new lighting appliances for the fall season. Dinner for members and guests will be served at Haddon Hall, at 6 P.M. Members are cordially invited to bring guests, but are requested to advise the Secretary promptly of their intention. Those desirous of obtaining further information regarding the Association and its meeting are requested to communicate with the following:

New Members.—Mr. O. F. Potter, 759 Broad street, Newark, N. J.

Arrangements.—Mr. J. C. Lightfoot, Jr., Real Estate Trust Building, Philadelphia, Pa.

Papers and Exhibits.—Mr. H. Thurston Owens, 42 Pine street, New York.

Very truly, A. H. Osborn, Secy.

BRIEFLY TOLD.

The Joint Programme, Current Meetings, Canadian and Michigan Gas Associations.—Here are the details (reprinted from our last) given in barest outline of the named meetings:

Canadian.—Fifth Annual. Place and date, Toronto, Ont., September 3d and 4th. The business meetings, which will be called promptly at 9 A.M., will be carried on in the hall of the Engineers' Club, 94 King street, West. Order for Tuesday, Sept. 3d Meeting:

Register at Engineers' Club and get souvenir identification badges. Routine business. Presidents address, and these papers: "Reconstruction of an Old Retort House," by Mr. Howard E. Mann; and "Suggestions for Increasing the Industrial Use of Gas," by Mr. H. E. G. Watson.

A recess (to last from noon until 1 P.M.) for luncheon here is listed. For the afternoon the paper list provides for these numbers, in this order:

"Consumers' Accounting and Records System," by Mr. J. J. Armstrong; "Medium High Pressure Gas Distribution in Montreal," by Mr. C. H. Osler; "Gas *vs.* Coal for Water Heating Appliances," by Mr. C. W. Allman; "Commercial Lighting in Toronto," by Mr. W. I. Fuller.

The second day (Sept. 4th) will thus be taken up: 10:30 A.M.:

A business meeting of the Association, commencing at 10 A.M. At 10: 30 members and friends (including ladies), holding Association badges, are to be guests of the Entertainment Committee, who, through the kindness of Mr. Arther Hewitt and the Directors of The Consumers' Gas Company, are to provide sight-seeing busses to take the visiting members and friends of the Michigan Gas Association, also to be in session in Toronto on Sept. 4th, aboard the steamer "Rochester" at the docks of the Richelieu and Ontario Navigation Company. Thereafter the members and friends of both Associations, including ladies, will be entertained as follows:

Motor bus trip to Station B. Plant of the Consumers Gas Company, where a short tour of inspection will be made. Thence to the city for luncheon. Thence on a sight-seeing trip through the Queen City, arriving at the Canadian National Exhibition Grounds at about 4:30 P.M. There the party will be taken to the Gas Show Building, where an excellent display of gas appliances will be on exhibition. After the visit to the Show, the party will then be free to visit the many other attractions at the Exhibition Grounds, until 8 P.M., when they will again be the guests of the Entertainment Committee, who will provide reserved seats in the grandstand for the evening vaudeville performance and display of fireworks. The official programme of the Canadian Association will be concluded Wednesday evening.

The programme of the Michigan Gas Association is thus arranged: The dates are September 4, 5 and 6:

Wednesday, Sept. 4 (early A.M.).—Arrive in Toronto by sleepers from Detroit and other points East and West. Go direct to steamer "Rochester," at docks of B. & O. Navigation Company. Send baggage there also. The C. P. R. has arranged for extra cars and special rates from Detroit to Toronto, leaving 11:40 Sept. 3, arriving 8 A.M., following day. Secure these through A. E. Edmonds, 7 Fort street, Detroit, prior to Sept. 1.

Eight to 10 A.M.—Register on boat immediately on arrival in Toronto, and receive identification badges and particulars respecting programme. This is important.

Ten to 12 M.—Sight-seeing, visit to gas works, automobile ride, luncheon, all at the thoughtful courtesy of the Canadian Gas Association.

Afternoon.—Visit to the Canadian National Exposition, including inspection of the gas appliance exhibit.

Evening.—Occupy special reserved sections of grandstand for fireworks' display at Exposition.

September 5th, 6 A.M.—"Rochester" leaves dock for 2 days' trip; breakfast aboard, 8:45 A.M.; arrive at Youngstown, for side trip to Niagara Falls; 9 A.M., leave Youngstown (Gorge electric line) for Falls, arriving there at 10:15. Leave Falls, arriving at Youngstown at 4:15 P.M, and continue trip to Thousand Islands; 8 P.M., business session on boat.

September 6, 6:30 A.M.—Reach Thousand Islands, pass through and reach Ogdensburg at 10:30. After an outdoor box lunch, at 1 P.M., the return to Toronto through the Islands is taken up. In the evening a second business session is held.

September 7th.—Toronto is reached at 5 A.M.; an early breakfast is served on the boat, and members can get early trains, either west or east. These papers will be read:

"Gas Versus Coal for Water Heating Appliances," by Mr. D. W. Allman.

"Increasing Sales of Gas Appliances by Special Campaigns," by Mr. Philip Buckley.

"The A. B. C. of Gas Company Advertising," by Mr. Richard Fowler.

"Variation in Heat Units in Condensing and Scrubbing of Coal Gas," by Mr. A. I. Snyder.

"The Electrical Separation of Tar from Coal Gas," by Prof. A. H. White, Messrs. John W. Hacker and Frank Steere.

"Large Profits in Small Economies," by Mr. T. J. Weber.

"Gas Collections," by Mr. F. J. E. O'Hara.

CURRENT MENTION—

LAST week we noted that the New Jersey Consolidated Gas Company had filed a certificate announcing an increase in its capitalization to $10,000,000, from $1,000,000. The title of the Company should have been the Consolidated Gas Company of New Jersey instead of the New Jersey Consolidated Gas Company. We are not in any sense attempting to excuse the error, but it does look that the officials of New Jersey should see to it that corporations having no affiliation whatever in respect of operation or capitalization should at least have distinctive titles.

MR. T. WILSON BATTIN informs us that the Civic Service Corporation has been formed, to take over and prosecute the public utility and general engineering business which have been formerly conducted individually by Mr. T. Wilson Batten and Mr. A. L. Osgood. These gentlemen have been in the business for a number of years in an advisary capacity for others and are turning over and consolidating several going concerns. "The territory of which they deem it inadvisable at this time to disclose." The officers of the concern are: President, S. Henry Stetson; Vice President and Secretary, T. Wilson Battin; Treasurer, J. Lee Patton; General Manager, A. L. Osgood. It will be noted that the General Manager is the Corporation's staff who fails to let the public know the letters of his "middle name."

MR. DARLINGTON TURNBOLT, President of the Louisiana (Mo.) Light, Power and Traction Company, and at one time Mayor of Lincoln, Ills., died at the home of his daughter (Mrs. T. T. Beach) the morning of August 22d. He was in his 86th year, and at one time was prominent in gas works' construction, having been the organizer of the National Gas Works' Building Company, St. Louis, Mo. That concern constructed the gas plants at Jackson, Miss., Brownsville, Tex., and other points.

ANOTHER contemporary of Mr. Turnbolt (Mr. John P. Foss) passed away at Chicago, Ills., the morning of the 19th ult. Deceased was in his 95th year, having been born in Bow Bush, N. H., July 28, 1816. Having acquired the trade of a machinist he removed to Chicago (1840), where he, in connection with Matthew Laflin and others, organized a water works' station, the pumping machinery being established at the junction of Michigan avenue and Lake street. It is notable that the distributing system was composed of wooden tubes (cedar logs, drilled out), similar to those originally laid down by the first regularly organized water supply company in New York city (the Manhattan Company), which supplied water to the district between Barclay street and the Battery, starting in about 1796. Deceased was the first engineer operating a train to cross the Lake trestle on the Illinois Central Road's right-of-way. He operated a planing mill in Chicago (1847-48) and in 1849 joined the procession to California in search of gold. In 1851 he returned to Chicago to engage in the lumber business, which brought him a large fortune. In 1854 he, in conjunction with his brother Robert, organized the Peoples Gas Light and Coke Company, and in 1856 he managed to secure the assent of the State Government to causing the charter to be declared a perpetual one. This is the charter under which the final consolidation of the gas interests of Chicago was perfected, and under which the supply is now carried on. He retired from active business in 1873 with a competency, but ill judged investments, added to some pretty hard experiences at the hands of those whom he had befriended, caused his fortune to crumble. Always prominent in the Masonic fraternity, his declining years (as well as those of his widow, who is in her 95th year, and who has long been an inmate of the Mattoon Masonic Home for the Aged) were smoothed by their fraternal action. The funeral services were held in Chicago the afternoon of August 24th, under the auspices of Oriental Lodge, A. F. and A. M., and Chicago Lodge, No. 55, I. O. O. F., and interment was made in Rosehill Cemetery.

Correspondence.

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

"Scientific Advertising."

PHILADELPHIA, PA., August 28, 1912.

To the Editors, AMERICAN GAS LIGHT JOURNAL: It has come to my attention on numerous occasions that our English fraters allow their names and positions to be used for advertising purposes to an extent quite unheard of here. Can you imagine the hard-headed, immobile features of the thrifty head of a large glassware manufacturing company dressed in college-cut clothes and done in colors, the work of art being labeled a cartoon, for fear perhaps that it might not flatter, and then inserted in a supposedly social magazine. To insure that no business prospects are overlooked copies are mailed to members of the British Illuminating Engineering Society, whether they be of the elect, socially or not. Perhaps ultra scientific glassware needs *outre* ethical promotion!

Conservatively yours, "GAS."

Mr. B. B. Stewart's Views on the "Gas as an Illuminant" Controversy.

PITTSBURGH, Pa., August 24th, 1912.

To the Editors, AMERICAN GAS LIGHT JOURNAL: In the JOURNAL dated August 19th, Mr. R. F. Pierce takes issue with some statements made by Mr. Conroy, of the General Gas Light Company, in Mr. Conroy's letter published in your issue of July 29th. Mr. Conroy, in his letter, criticizes some statements made by Mr. V. R. Lansingh in his lecture, "Gas as an Illuminant" delivered during the Centenary Celebration, Philadelphia, last April. Allow me to suggest that Mr. Pierce has sidestepped the issue entirely, and has attempted to introduce and open for discussion a phase of the question not mentioned nor intended either by Mr. Lansingh or Mr. Conroy. In his lecture Mr. Lansingh said, "Lamps should be rated in terms of their total flux, rather than their mean horizontal candle power, if we are to obtain comparative figures;" also, "The gas arc has been an attempt to obtain a large unit of high candle power where a large flux of light is wanted, but * * * the gas arc is no more efficient if as much so than the individual burner." These are the statements Mr. Conroy wished to correct, and rightly so; for if the gas men believe such they will be readily led into error. Mr. Pierce attempts to disprove Mr. Conroy's statements by resolving the question of general illumination down to one of efficient and useful illumination on a given working plane, which plane he assumes is always below the horizontal. He also takes Mr. Conroy to task for unfair comparison in using the "Reflexolier" equipped with suitable glassware, against an arc lamp having a clear globe, yet in the same article he quotes his comparison, supposed to be absolutely fair and above criticism, in which he compares arc lamps having opaline globes with mantle lamps having prismatic reflectors, a wonderful example of consistency. The superiority of the arc lamp over the single burner lamp for general lighting, and its greater efficiency, have been so well and universally established that there is no room for argument on this subject. This attempt on the part of Mr. Pierce to divert the issue begggars the situation, and amuses one greatly.

Very respectfully yours, S. B. STEWART.

(*Continued from page* 151.)

REPORT OF SECRETARY AND TREASURER.

Secretary-Treasurer Harman then read his annual report. As Treasurer he reported a receipt (including balance on hand) of $1,956.96, a disbursement of $1,085.67, and a balance of $871.29.

As Secretary, Mr. Harman reported to the 1st April a net active membership of 155; and the applications in hand would bring the total current membership to 186, the highest in the history of the Association. [Great applause.]

Messrs. Ruenzel, Kurtz and Haase were appointed a Committee of Audit.

On motion, the reports were ordered received and placed on file.

The Vice-President assumed the chair and the President read the following

INAUGURAL ADDRESS.

Gentlemen of the Wisconsin Gas Association: We meet here again to hold the 11th annual meeting of our State Association. While absent from the meeting a year ago, the Association did me the honor of electing me your President, and, while fully appreciating the honor accorded, I can only say that, on account of my being absent did you succeed; but I will do the best I can to merit that honor. The past year has been one of quiet, probably owing to the fact that our State Legislature only meets every two years; but before another meeting of this Association we may be called upon to see that none of the good work done in the past is undone.

No startling innovations in our work have occurred. Chamber ovens and vertical retorts are still in an experimental stage, as far as these methods in this country are concerned, but if either of these methods proves a success in reducing manufacturing costs, I cannot but feel that the Wisconsin gas interests will be among the first to adopt them.

I think most, if not all, of us are glad that we have the Railroad Commission to look after us and keep us out of politics. We are now at liberty to give all of our attention to our business as public utility servants; and we must not lose sight of the fact that we are public servants. We have been under the control of the Commission long enough so that, through the commission system of uniform accounts, we are able to see wherein we must look for improvement. This uniform system of accounting also enables us to make comparisons much better than formerly.

Our watchword should be "Service;" this comprises nearly the principal part of our work. The rest is supplementary only. If we give the service under the rules laid down by the Commission, using our energies to the end that we give the very best service possible, and instilling into our employees that "Service" is what counts, we will each soon gain the confidence of our different localities, and not only will many of the petty annoyances to which we have in the past been subjected disappear, but our customers will feel we are for them and not against them.

We should not be afraid to spend money for service, for, if we give not only service, but the very best service of which we are capable, the returns will be ample, not only in a financial way, but the best asset any company can have—the confidence of the public which it serves.

Your officers have endeavored to make a programme for this meeting that will be both pleasant and profitable. We have no great number of papers; but if the papers that are to be read are fully discussed none of us will go away without having been benefited. This discussion, gentlemen, is up to you; please make the most of it.

We also expect to listen with much pleasure to representatives of the Railroad and Industrial Commissions, and I bespeak for them your hearty co-operation in their work. We want them; and they are here, we hope, to stay.

To the members or representatives of these Commissions, we welcome you and ask you to take part in our meetings, permitting us to ask questions, and if any of you wish to ask questions, do not hesitate to do so, as we wish you to feel that you are one of us.

Gentlemen, with these remarks, and again thanking you for the honor of having been chosen President of this Association, the meeting is in your hands. [Much applause.]

SOME TELEGRAMS AND LETTERS.

The President—It has been customary to appoint a committee on the President's Address, but as I do not feel that the President's Address contains anything that it is necessary to refer to a committee, we will dispense with that proceeding this morning.

The Secretary read these telegraphic messages that had been received.

CHICAGO, ILLS., May 15, 1912.

Mr. Henry Harman, Milwaukee: Telegram received. Have just returned from the West. Impossible to be there to-night; maybe Thursday. Greatly appreciate honor. Please give my best regards to the boys. EDWARD G. PRATT.

NEW YORK, May 14, 1912.

Henry Harman, Secretary, Hotel Pfister, Milwaukee. Regret inability to attend meeting of Wisconsin Gas Association, and hope that you have a most successful convention. HENRY L. DOHERTY.

The Secretary read this communication from the Builders' Exhibit Association:

MILWAUKEE, WIS., May 9th, 1912.

Mr. Henry Harman, Secretary Wisconsin Gas Association:

We notice your Association holds its 11th annual convention in this city, May 15th and 16th. It is all good and well to talk gas at your meetings, going into the minutest details thereof, but when these meetings are over, we wish your members to pay a short visit to the Builders' Permanent Exhibit Rooms, No. 456 Broadway, 1½ blocks north of Wisconsin street. We are confident that your members will never regret spending the time to come here, as this is the only institution of its kind in the entire Northwest. Assuring you we appreci the opportunity to address you on this subject, we are,

Sincerely yours, BUILDERS' EXHIBIT ASSOCIATION.

The President said he had a request from a representative of the "Germania" and "Free Press" papers of Milwaukee, who wished to take a picture of the members at the close of the session, for publication in next day's issue of the papers named.

The President then announced the arrangements reported by the Committee on Entertainment, and hoped that all would report promptly at 2 P.M., at which hour he understood that Commissioner Crownhart would address the Association.

A FRATERNAL EXPRESSION.

Mr. B. J. Kellum said he understood Mr. David Douglas was seriously ill at Manitowoc, and he thought, considering the length of time Mr. Douglas had been a member of the Association, and remembering his able and faithful services, it would be most fitting for them to extend sympathy and good cheer to him now. He was not aware of his actual condition, but he did understand he was critically ill. He moved that the Secretary be instructed to telegraph him their best wishes. Amended by Mr. Gregg that the Secretary, in addition to the telegram of sympathy, order from some Manitowoc florist a basket of flowers to be sent to the patient. [Accepted, by rising vote.]

On motion, it was decided to adjourn to 2 P.M.

FIRST DAY—AFTERNOON SESSION.

The President, before proceeding with the address from the Chairman of the Industrial Commission, appointed as a Nominating Committee Messrs. B. F. Lyons, John Corscot and Wm. Jones, instructing the Committee to report as soon as convenient.

ADDRESS OF COMMISSIONER CROWNHART.

The President introduced Mr. C. H. Crownhart, Chairman Wisconsin Industrial Commission, who delivered the following address:

Mr. President and Gentlemen: It gives me great pleasure to meet with you to talk over our common problems. As your President has stated, I shall be glad to try to answer any questions that it may occur to you to ask.

The Industrial Commission was created at the last session of the Legislature of Wisconsin, to deal primarily with the relations of employer and employee. The Rate Commission was created some years ago to deal with the public service corporations and their relations to the public, but the field of the Industrial Commission is broader, for it takes in all employers in dealing with their relations to their employees. That does not mean, of course, we are dealing specifically with your contracts with your employees, but with those relations of safety, health, sanitation, ventilation and compensation, where it is up to some arbiter to pass judgment between the employers and the employee.

Our greatest work at present is along the line of accident prevention. We took over the Bureau of Labor and Industrial Statistics, that had charge of accident prevention before this Commission was

established. All over these United States a great campaign is going on now to lessen the number of accidents; and Wisconsin is not following, but is rather taking the lead in that work, especially in the last year. We have engaged experts along that line, and are dealing with rules of sanitation and safety in which you will be more or less interested.

You will perhaps be interested also in understanding the methods that we have adopted. Prior to the creation of the Commission the Legislature would make the rules in a narrow sense. That is, it would say that a cogwheel should be guarded, or that a set screw should be guarded; and when it once laid down that rule it became the law of the land, and your companies were immediately required to put that rule of law into force.

The Legislature now has laid down the broad rule that all places of employment shall be safe, and "safe" means as safe as can be made, considering the industry and the character of the work. It has left to the Commission the power of investigation, just as it has left the Railroad Rate Commission the power of investigation of rates; and, having investigated the subject and ascertained what the fact is, the Commission merely lays down the particular rule that carries out the intention of the Legislature. The Legislature says: "It shall be safe." The Industrial Commission investigates and finds out what method will make a certain employment safe, within the meaning of that term. In order that we might deal with the employers of labor on terms of familiarity, and come in close contact and touch with you and understand your work and your methods, and what things are practical to do, we assisted in the selection of a committee. On that committee were representatives of the Wisconsin Manufacturers' Association, representatives of accident insurance interests, representatives of the Wisconsin Federation of Labor, representatives of the Milwaukee Merchants' and Manufacturers' Association, members of our Commission, and special representatives of the Commission.

The various members of these committees got together, studied over these problems, went through the factories and figured out what things could be done, and practically done, to improve conditions. Following the Committee's recommendations, the Commission has adopted something like 30 rules or orders which have the force of law. These will be published in a "Bulletin," which will come out in a day or two of which you gentlemen will no doubt all get copies. If you are not on our mailing list, the "Bulletin" will be sent upon request. You are not so much interested in this proposition as the manufacturers are, but to a certain extent I suppose you deal in dangerous machinery, and will be interested in these orders. The Commission has to do also with various other ideas with reference to the relation of employer and employee; for instance, the apprenticeship contract. Perhaps you don't have any apprenticeship contract, though you may have; but, primarily, your President tells me you are interested in this question of workmen's compensation, which is also administered by the Commission.

The Workmen's Compensation Act was passed at the last session of of the Legislature, and at about the same time some 10 other States passed workmen's compensation acts.

This system is not new, though it is new to us in a way. Germany established (25 years ago) such a system, and all European countries have some form of workmen's compensation.

It is our belief this will work out to the interest of the employer as well as the employee. We have the very wasteful system of litigating all the cases where disputes arose between the employers and employee with reference to accidents—personal injuries. This system worked a great many hardships, and a great many abuses grew out of it. One abuse was the danger of having some very large judgments rendered against employers; and it became necessary for them to secure insurance, and thus liability insurance was developed.

Now, liability insurance is a business, and the promoters and organizers of those companies establish them to make money. There was no question of sentiment about it. Usually foreign companies that are here merely deal on a business basis, whereas, with the employer dealing with his employee, there is always a question of sentiment. When you have an employee who has worked with you a number of years and he is entitled, as you think, to consideration, you want to see him remunerated to some extent if he gets hurt, irrespective of whether he or you was at fault. That is the humane sentiment which dominates and enters into all our relations and with all people; but when you had employer's liability under the old system, you had nothing to say as to whether or not this man should be compensated. The rule was laid down in the policy given you when you secured employers' liability insurance, that you were to leave this matter of compensation to the insurance company; and many of the companies laid down rules that are very much more harsh than these. They said that you could not give him compensation out of your own pocket, because that enabled him to litigate his case and get into a position to fight the insurance company. The compensation act is intended to take away all possible litigation.

Mr. Schall asked if the insurance company did not simply guarantee the manufacturer or employer against liability?

Mr. Crownhart—No.

Q.—They will not guarantee him against litigation?

A.—No; they do not. No policy that I have ever seen guarantees the employer against litigation. It says in the policy that he must litigate if the insurance company demands it. He must stand as the defender.

Q.—That is, they protect him against litigation?

A.—No, they do not. He has the litigation; he is bound to have that if the insurance company says so; but the policy up to the amount of its face protects him against loss from litigation. That is the distinction; you must litigate these cases no matter whether you think the poor fellow should be paid or not. If the insurance company says that the litigation must go on, it goes on; and it goes on against you, not against the insurance company; but the insurance company furnishes the lawyer, pays the witnesses, and if judgment is rendered against you, pays the judgment up to the amount fixed in the policy. Of course when you get an insurance policy you often think you are absolutely protected, whereas it frequently happens that you are not protected—for instance, you have a limit in your policy of $5,000. Most of the policies contain that limit; you can stipulate for a higher amount if you pay a higher rate. Frequently judgments are rendered for more than $5,000, in which case you would have to stand the difference between $5,000 and the amount of the judgment.

Another thing that an employer was telling me about last night. It is not new to him, but it recalls to my mind that, where there was a death limit by statute, of say, $5,000, and a person was killed, the insurance policy's limit was $5,000; but if the limit in the policy is $5,000 and the death may be $10,000 by statute, the companies always have a chance of winning the case. They won't settle unless they can settle under $5,000, because they will take their chance always. That is business. I am not blaming the insurance companies at all.

Now, these defenses grow up along with this method. In the old days a person was liable for the acts of his servant. That is the old rule; and it is the rule to-day. If you send your man out here with an automobile and he carelessly runs down somebody, you are liable for the injury. But the court stepped in and said: As applied to another employee, another servant, this rule worked a hardship on the employer; and so they established the fellow-servant rule, and that is an exception to the general rule. It was not established by the Legislature, but by the courts, that where one servant was injured from the negligence of another servant, he could not recover.

That was applied to simple conditions when the rule was first laid down. The rule arose in this way: An engineer and a fireman were working in a cab, the old-fashioned locomotive cab (it happened in 1838). The fireman was injured by the acts of the engineer. The court said: Here were these two men standing side-by-side in the cab. Each could see what the other was doing, and they were more capable of guarding themselves against the acts of each other than the master was who was not there, and there is some force and reason to that rule. But, it developed later on the court held that this engineer who was running the engine was a fellow-servant of the telegrapher who was 200 miles away and who gave the wrong despatch and put the engineer in the ditch. You see the reason of the rule had departed; the engineer could not have any control over the telegrapher, and the telegrapher had no relation whatever with the engineer; but that was the extent to which the fellow-servant doctrine was finally carried. So it became a rule of injustice. The superintendent who directed and controlled the servant was held to be a fellow-servant, so that if he put him in a dangerous place, and he was hurt by reason of that, the servant could not recover, because the superintendent was the fellow-servant of the man who was doing the work.

This rule was abolished by the legislature in 1911, as well as the rule of assumption of risk. The latter was a court-made rule also. The court said that when a man went into a place to work and he could see the danger and appreciate it, then it must be assumed that he contracted with reference to it. His contract implied that any dangers that existed under those circumstances were his dangers, and

that he was paid for assuming these dangers. Now in a way, that rule had some justice in the early day when there were simple methods of work and simple means of appliances; when men could always see and appreciate the situation; but how does that rule apply in this day, for instance, when a man goes into a coal mine and, because of the negligence of the owner of the mine, is killed by the coal falling on him, or by reason of the gases that have developed in the mine, or by reason of an explosion over which he has no control, and against which he cannot possibly protect himself?

This rule of assumption of risk was abolished in 1911, so that if you were sued now by an employee who had been injured in your service, you could not set up these two defenses against the employee. Following the abolishment of those two rules, which gave the servant about two chances to recover where he had one before, the insurance companies doubled their rates of liability, and that accounts to a large extent for the doubling of their rates.

But as an alternative to this old method, the legislature established this compensation act, so that if you do not choose to accept liablility is placed upon you by the common law, and you may take the compensation act and work under that instead.

Under the compensation act the first thing done was to limit the amount of recovery in any case; and they limited it to 4 years' salary, not exceeding $750 a year; so your limit would be $3,000 in any one case. In such cases it is not so necessary to carry insurance as it was before. You can take a chance at a $3,000 award where you would not be willing to take a chance at a $20,000 verdict; and they have had $20,000 verdicts in this State. Then they said that this question of compensation should not depend on "fault." The old law depends on "fault," that is, as to who is to blame. This law of compensation does not depend on that. They say that most of these accident come as a risk of the employment—one of the inevitable things coming along with employment.

I know you will say—most of you do say, because we get your reports—that the employee was to blame; that he was at fault. When you say that, you frequently do not take into consideration all the circumstances. You have to treat this employee as a human being. Almost anyone could escape an accident if he adopted the right means of escape. So you may say as everybody that is hurt could have escaped accident, hence he was at fault. For instance, a man crossing the street is run down by a street car. He could escape that accident by staying on the sidewalk, and perhaps he ought to have stayed there instead of crossing the street; but you have to take into consideration many other things. You must bear in mind that these employees of yours are not as intelligent along those lines as you are. Many of them are thoughtless. They have not had the education and advantages that you have had, and then you must take into consideration that this fellow who was so stupid to-day was perhaps sitting up all night with a sick child at home, or perhaps the wife is sick; perhaps he is not feeling well himself to-day—and that is what really caused the accident. It is plain enough that he was to blame, if you do not take into consideration all these other circumstances.

There is a case on record of an employee who came along and saw a machine that worked over a fulcrum and bolt that was passed through it. He saw that the bolt was out. He was a boy, and carelessly, of course, just stuck his finger in where the bolt was. Just then the machinery started and sheared his finger off. That is the human nature of the boy; he is inquisitive. Men do not lose all of that inquisitiveness even when they grow up. They are inquisitive and do such things thoughtlessly. You say it is more or less willful and intentional almost. But that is not true; it is one phase of human nature—that is all there is about it. So this law does not depend on carelessness, on fault. The employee is not entitled to recover if he is guilty of wilful misconduct—that is, intentional wrongdoing; but for mere fault or mere carelessness he is not held to blame. They blame the industry—not you, but the industry. They say that things will happen in every industry. Then the only question is, did he get hurt in his employment; did he get hurt by accident? Then, if he was not guilty of intentional and wilful misconduct, he is entitled to recover this compensation. The compensation is based on a loss of wage.

(To be Continued.)

RECENT advices from Sarnia, Canada, are to the effect that a plant for the manufacture of artificial gas will be included in the plans for the new street car power house. Rumor has it also that the supply of natural gas may give out at any time, and the local Gas and Electric Company intends to be prepared for anything that may happen.

Progress Making in the National Commercial Gas Association.

That the new company membership plan, recently adopted by the Association, is meeting with approval by the gas fraternity, seems shown by the following list of companies enrolled:

Company.	Location.
Aberdeen Gas	Aberdeen, S. D.
Alliance Gas and Power	Alliance, O.
American Gas:	
Bangor Gas	Bangor, Me.
Burlington Light and Power	Burlington, Vt.
Citizens' Gas and Electric	Waterloo, Ia.
Kewanee Light and Power	Kewanee, Ills.
Kingston Gas and Electric	Kingston, N. Y.
Luzerne County Gas and Electric	Plymouth, Pa.
Peru Gas	Peru, Ind.
Petersburg Gas	Petersburg, Va.
Philadelphia Suburban Gas and Electric	Chester, Pa.
" " " " "	Coatesville, Pa.
" " " " "	Jenkintown, Pa.
" " " " "	Pottstown, Pa.
Portage-American Gas	Portage, Wis.
Rockford Gas Light and Coke	Rockford, Ills.
St. Clair County Gas and Electric	East St. Louis, Mo.
Waukesha Gas and Electric	Waukesha, Wis.
Brooklyn Union Gas	Brooklyn, N. Y.
Carolina Power and Light	Raleigh, N. C.
Central Hudson Gas and Electric	Poughkeepsie, N. Y.
Central Indiana Gas	Muncie, Ind.
Charles City Gas	Charles City, Ia.
City Gas	Norfolk, Va.
Concord Light and Power	Concord, N. H.
Consolidated Gas, Electric Light and Power	Baltimore, Md.
Consumers' Gas	Toronto, Canada.
Consumers' Gas	Reading, Pa.
Dawes Brothers, Inc	Chicago, Ills.
Denver Gas and Electric	Denver, Col.
Enid Electric and Gas	Enid, Okla.
Everett Gas	Everett, Wash.
Freeport Gas Light and Coke	Freeport, Ills.
Fremont Gas, Electric Light and Power	Fremont, Neb.
Grand Junction Electric, Gas and Mfg.	Grand Junction, Col.
Greencastle Gas and Electric Light	Greencastle, Ind.
Hattiesburg Traction	Hattiesburg, Miss.
Jackson Gas	Jackson, Mich.
Kansas Gas and Electric	Wichita, Kas.
Keene Gas and Electric	Keene, N. H.
Keokuk Electric	Keokuk, Ia.
Knoxville Gas	Knoxville, Tenn.
Laclede Gas Light	St. Louis, Mo.
Lawrence Gas	Lawrence, Mass.
Lebanon Gas and Fuel	Lebanon, Pa.
Lincoln Gas and Electric	Lincoln, Neb.
Lockport Light, Heat and Power	Lockport, N. Y.
Long Beach Consolidated Gas	Long Beach, Cal.
Malden and Melrose Gas	Malden, Mass.
Marlborough-Hudson Gas	Boston, Mass.
Meridian Light and Railway	Meridian, Miss.
Montgomery Light and Water	Montgomery, Ala.
Montreal Light, Heat and Power	Montreal, Canada.
Municipal Gas	Albany, N. Y.
New Bedford Gas and Edison Light	New Bedford, Mass.
Paducah Light and Power	Paducah, Ky.
Peoples' Power	Rock Island, Ills.
Portland Railway, Light and Power	Salem, Ore.
Pueblo Gas and Fuel	Pueblo, Col.
Quincy Gas, Electric and Heating	Quincy, Ills.
Saginaw City Gas	Saginaw, Mich.
Southside Gas and Electric	Mesa, Ariz.
Southern Counties Gas	Los Angeles, Cal.
Spokane Gas and Fuel	Spokane, Wash.
Suffolk Gas and Electric	Bay Shore, N. Y.
Traverse City Gas	Traverse City, Mich.
Tri-City Gas	Gadsden, Ala.
Watertown Gas	Watertown, S. D.
Woonsocket Gas	Woonsocket, R. I.
Manufacturers.	
Blaugas Co., of America	New York City.
Connelly Iron Sponge and Governor Co.	New York City.
Detroit Stove Works	Detroit, Mich.
Estate Stove Co.	Hamilton, O.
Fuller-Warren Co.	Milwaukee, Wis.
General Gas Light Co.	Kalamazoo, Mich.
Humphrey Co.	Kalamazoo, Mich.
Improved Appliance Co	Brooklyn, N. Y.
Manufacturers' Sales Co.	Columbus, O.
Mueller Mfg. Co., H.	Decatur, Ills.
Pittsburgh Water Heater Co.	Pittsburgh, Pa.
Philadelphia Stove Co	Philadelphia, Pa.
Reznor Mfg. Co.	Mercer, Pa.
Roberts and Mander Stove Co.	Philadelphia, Pa.
Ruud Mfg. Co.	Pittsburgh, Pa.

Manufacturers.	Location.
Safety Gas Lighter Co	Haverhill, Mass.
Strause Gas Iron Co	Philadelphia, Pa.
Weir Stove Co.	Taunton, Mass.
Welsbach Co	Gloucester, N. J.
John Wood Mfg. Co	Conshohocken, Pa.

In addition to the Companies listed, assurances have been received from the United Gas Improvement Company, of Philadelphia, that all the plants operated—some 40 in all—will also be enrolled. This showing in so short a time is most encouraging and will enable the Association to enlarge the scope of its usefulness.

The schedule of annual dues under which Company members enroll is shown below. It has been computed so as to make it a hardship on no Company, either large or small, and all will benefit to a like degree.

Annual Dues of Company Members.

Population Served by Companies.	Subscription.
Less than 10,00	$10
10,000 to 25,000	15
Over 25,000 to 50,000	20
Over 50,000 to 100,000	25
Over 100,000	50
Foreign	25
Holding Companies (in the event underlying Companies are in membership)	50
Manufacturing	25

The educational work of the Association will be continued, and (starting September 1st) the original course of lectures will be again used in a new class, in addition to which another class is starting and will cover the following subjects:

"The Gas Company, the Government and the Public."
"Principles of Corporate Organization and Interdepartmental Relations."
"Manufacturing."
"Distribution."
"Auditing and Purchasing."
"Selling."
"Special Campaigns."
"Applications and Credits."
"Installations of Meters and Appliances."
"The Order Department and Dispatch."
"Meter Reading, Consumers' Records and Collections."
"Complaints and Correspondence."

Over 100 members of the 1911–12 class received certificates upon the completion of the first course. To assist the members this year company classes are being formed, with a class leader who will explain the lectures, call meetings for the discussion of the lessons, and generally assist the members of the class.

The Association renders advertising service to its company members by collecting copy from various companies and redistributing full sets of copy received to each member company.

A collection of photographs has been gotten together, showing window displays, office arrangement and showroom layout, which collection is loaned to any company upon request, the only cost being the expressage.

The annual convention and gas appliance show—this year held in Atlanta, Ga., December 2d to 6th inclusive—will be well attended by gas men from all parts of the country, and the manufacturers have responded generously to make this Exhibition a success. Spaces 73, 89, 90, 91, 96, 97, 98, 99, 100, 101, 107, 108, 109 are the only ones not contracted for, and any manufacturer wishing to exhibit should make application at once.

Every gas man interested in the commercial side of the business should join the Association, and gas companies are asked to lend their aid by taking out company membership. Increased sales of appliances and water gas output are what we are aiming for, and it rests with the companies to help support the movement to bring about the desired result.

MR. J. W. KING, of Ottawa, Kas., has resigned the position of Manager of the Ottawa Gas Company. His successor (Mr. E. H. Becker, of the Western Acetylene Company) assumed the duties nominally the 1st inst., but the active Manager will be his son, Mr. J. W. Becker. Mr. King retires from the service to associate himself with Mr. J. S. Small, of Kansas City, to engage in the electrical supply business and to prosecute the business of constructing gas plants in small towns, for which right he holds franchises.

Mineral Waste.

In the preface to Bulletin 47, "Notes on Mineral Waste," written by Mr. Charles L. Parsons, Chief Mineral Chemist, Bureau of Mines, which has just been issued, Dr. Joseph A. Holmes, a Director, thus gives his views upon what he terms real or true conservation:

"During the past year, in producing 500,000,000 tons of coal we wasted or left underground, in such condition that it probably will not be recovered in the future, 250,000,000 tons of coal; we turned loose into the atmosphere a quantity of natural gas larger than the total output of artificial gas during the same period in all the towns and cities of the United States; we also wasted or lost in the mining, preparation, and treatment of other important metalliferous and nonmetalliferous minerals from 10 to 15 per cent. of the year's production of such minerals. These losses serve to indicate the importance of inquiries and investigations by the Federal government for the purpose of lessening the waste of essential resources—investigations on the same general lines as those looking to a reduction in the loss of life in the mining operations of the country and the far more extensive investigations looking to the more efficient production and use of agricultural products, both of which are being conducted by the Federal government.

"In a consideration of possible activities of the individual, the State, and the Federal government, in behalf of a less wasteful use of our mineral resources certain facts and principles should be kept clearly in mind, namely:

"That the present generation has the power, and it will exercise the right, to use as much of the country's resources as it actually needs; there can and there will be no such thing as stinting the present generation by bottling up resources for the use of the future.

"That the nation's needs are not likely to be curtailed; these needs will increase with the extent and diversity of its industries, and will increase more rapidly than population increases, for the reason that the per capita consumption of mineral products is rapidly increasing; and that the men of this generation will not mine, extract, or use these resources at continuousfinancial loss to themselves in order that something may be left for the use of future generations; there can be no such thing as a mineral industry without profits.

"Furthermore, it should be clearly understood that the mineral resources of this country have required long ages for their accumulation and that of these resources the nation has but the one supply. There are no known substitutes available to meet the nation's further needs when that supply will be exhausted and, to the best of our present knowledge, this one supply must serve as a basis for both the needs of the present and the far greater needs of the future.

"In a higher way our mineral resources should be regarded as property to be used and to be held in trust with regard to both the present and the future needs of the country. It should be remembered that neither human labor nor any human agency has contributed to their origin or to their intrinsic value, and that whatever rights the individual may possess have been derived from the general government and from the State as the original owner. The State does not surrender its rights, and should not neglect its duty, to safeguard the welfare of its future citizens by preventing the wasteful use of these resources. Though the individual may claim the right to use the resources in proportion to his needs and the needs of the community, he certainly has no right to waste that which is not needed for present use but is certain to be needed hereafter.

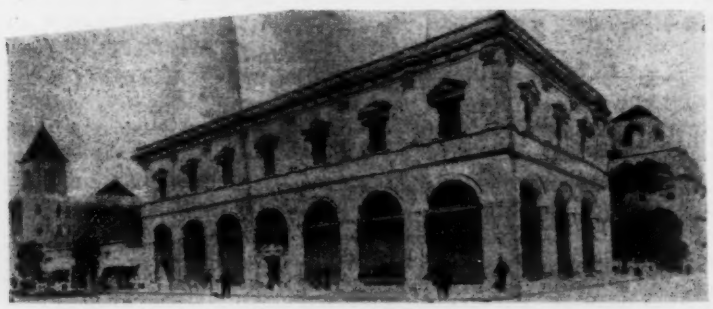
"Those in charge of the investigations of the Bureau of Mines recognize the rights and duties of the Federal government as being limited to the carrying on of inquiries and investigations with a view to determining the nature and extent of this waste of resources, the means by which it may be diminished, and the setting forth of the facts in the case.

"The present report embodies the results of certain preliminary inquiries as to the nature and extent of this waste. It will be followed by a more detailed report on the subject as soon as the necessary inquiries and investigations have been conducted and the results put in shape for publication.

"In the preliminary work along these lines, the representatives of the Bureau have received the cordial co-operation of the engineers and chemists associated with the varied mineral industries of this country and also of the owners and the operators of the mines and the metallurgical plants."

Management & Commercial Methods.

NEW OFFICE QUARTERS FOR THE CAMBRIDGE GAS LIGHT COMPANY.—Those who know Mr. A. M. Barnes, the moving genius of the Cambridge (Mass.) Gas Light Company, know that he is a man whose constant practice is to keep things orderly and up-to-date, and in this laudable spirit he is surely well supplemented by the advice and assistance of President Ballard, than whom no more public spirited citizen resides in beautiful Cambridge. Not long ago, in fact just prior to Mr. Barnes' departure for Europe (a trip from which he recently returned, benefited in every way), the active men in the Company agreed upon the fact that the Cambridge Gas Light Company needed a new office building, and the services of Messrs. Shepley, Rutan & Coolidge (the well-known architects of Boston) were requisitioned, and the result is here told, the telling being eked out by a perspective view of the proposed structure. To begin with, the struc-



ture will be located on the eligible site at the northwest corner of Massachusetts avenue and Temple street, with a frontage and depth of 62 by 121 feet. It will consist of two stories and a basement, the interior to have a mezzanine story, running along a section of the first floor. The main facade will be on Massachusetts avenue. The main entrance opens directly on a large room, 32 feet by 81 feet and 24½ feet high, which will be set apart for an appliance showroom. The room will be quite imposing, in that the arch motive of the exterior will be carried on all four sides, also forming penetrations in the ceiling, which is vaulted. Large show windows line one side of the apartment. The walls and ceiling are in fine plaster work, and the flooring is of marble. Around this large room are grouped the offices and workrooms of the Company. The office of President and General Manager and the Directors' room are at the right. To the rear is the general business office, lighted by means of large windows, with counters opening directly towards the appliance exhibition room. The cashiers' cages and vaults occupy the central portion of this space. A corner room, on Temple street, shut off completely from the other rooms, is arranged for stenographers and for the filing of documents, etc. On this floor is also a service entrance and shipping room, which takes up the space in the rear inner corner of the building, and which is also accessible from Temple street by a paved court, covered at the inner end for protection in the receiving and delivering of goods. This service has also an entrance or opening into the appliance room. A lamp room, which can be darkened for display purposes, completes the equipment on the floor—Engineer Kennedy has dubbed this "the photometrical room." The mezzanine story is reached by a broad staircase from the business office. The special room for the Directors is situated here; also, a second business office and vault, as well as the regular housing for the photometrical and calorimetric stations. Spacious rooms for the women are provided, also rest and lunch rooms, fitted out with a gas range and other necessary kitchen appliances. Going from the appliance section on the main floor another broad staircase carries one to the basement, in which it is planned to demonstrate practically the worth of all gas appliances, including ranges, heaters, etc., a goodly stock of which will be found ready for casual inspection. A storeroom, locker and rest room for the men employees are provided on this floor. Space is given for the heating and ventilating plant, with filter chamber and fan intended to supply fresh air to the various offices named. The building is thoroughly ventilated by the most approved system. The second floor will not be used for the present time on Company account, but will be left as one large room, the entrance to the floor being from Massachusetts avenue at the end of the building beyond the appliance room. The exterior of the structure is on the lines of the Italian Renaissance, and limestone will be the main material in its construction. Messrs. Walter A. Wentworth Company (Boston) are the contractors.

Items of Interest
FROM VARIOUS LOCALITIES.

MESSRS. CHAS. A. SMITH, J. E. Child, F. A. Swartwood, R. P. Ward, Thos. Lang, John Breen, J. F. Madden and F. Breen, as members of the Waseca (Minn.) Gas Company, have petitioned the Waseca Council for the right to construct and operate a gas plant there for a term of 25 years. The maximum that may be charged is $1.25 per 1,000 cubic feet, and the work of laying the mains must be begun within 2 months after the granting of the franchise, and that at least 2 miles of main must be laid within the year.

THE Coast Counties Gas Company has purchased all the capital stock of the Gilroy Gas Company.

AT the annual meeting of the shareholders of the New Bedford (Mass.) Gas and Edison Light Company the officers elected were: Directors, Messrs. Chas. R. Price, George R. Stetson, Fred. Taber, Oliver Prescott, John S. Parry, H. M. Knowles, L. B. Bates, P. M. Land, F. H. Gifford, W. H. Pitman and E. A. Cook; Treasurer and Clerk, Chas. R. Price. The by-laws of the Company (adopted in 1890) were repealed, and a new series or compilation adopted, a main feature of which is the providing for a Vice-President, which office will be filled by the action of the Board of Directors at a special meeting.

THE reports of the Portland (Ore.) Gas and Coke Company, which corporation is a member of the properties of the American Power and Light Company, for July, 1912, and the 12 months ended July 31, 1912, respectively, show net earnings for the fiscal year of $558,800, against $485,365 in the prior twelvemonth.

THE International Gas Generator Company, of New York city, has been incorporated, with a capitalization of $1,000,000.

A CORRESPONDENT in Providence, R. I., writing under date of the 26th ult., incloses this statement taken from a local paper:

"An announcement of important changes by the Providence Gas Company, including a reduction in the price of gas and the changing of the dial in recording meters, were filed with the Public Utilities Commission last Wednesday." Here is the text of the notice: "The price of gas to the general consumers of this Company will be 95 cents per 1,000 cubic feet for all gas consumed after October 1, 1912. A discount of 10 cents per 1,000 cubic feet of gas consumed will be made to consumers who pay their bills within 15 days of the date of the bill, making the net price to such consumers 85 cents per 1,000 cubic feet. A reduction of 1 cent per 1,000 cubic feet for each 1,000,000 cubic feet of gas used during the calendar year will be made to consumers who have paid their bills as rendered within the discount period. The amount of this reduction is to be paid by check at the end of each calendar year. When the extension now being made to Riverside, in the Town of East Providence, is completed, the price of gas to consumers in Riverside and vicinity will be $1.35 per 1,000 cubic feet, with a discount of 10 cents per 1,000 cubic feet, as per terms of payment stated above, making the net price to such consumers $1.25 per 1,000 cubic feet. There will be a minimum charge of 50 cents per month with refund if bills exceed $6 per year."

In explanation of this notice to the Public Utilities Commission, John W. Ellis, President of the Company, stated that this is a reduction in the price of gas to the present consumers of the Company of 5 cents per 1,000 cubic feet, making the net price 85 cents per 1,000 cubic feet. The last reduction in the price of gas was made on April 1, 1910, when the net price was fixed at 90 cents per 1,000 cubic feet. It has been the custom of the Providence Gas Company to reduce the price of gas to its consumers whenever the increase of business, as well as the results from more efficient methods of manufacture, would warrant it. The second clause in the notice to the Public Utilities Commission relates to the change in discount to the consumer, and this change from the present custom will take effect at the same time as the reduction in the price of gas, on October 1, 1912. This new system is in force in nearly all the large cities, such as New York, Philadelphia, Baltimore, Boston, Springfield, Lowell, Worcester, Fall River and Lynn and Pawtucket and Woonsocket. The circular definitely explaining this change of system of discounts, is as follows:

"For many years the Providence Gas Company has read all its

meters on the 17th, 18th, 19th and 20th of each month. The bills have been dated the 1st of the following month, and the discount period for all bills has expired on the 10th of that month. The plan was satisfactory when the number of meters was comparatively small, but with the present large and increasing number, there is serious congestion at the time of reading the meters and during the discount period. The congestion at the discount period is now so great that with the present system we are unable to serve our customers in a satisfactory manner. We have, therefore decided to adopt, on October 1, 1912, the plan already in use by many of the larger Companies in this country known as 'Continuous Meter Reading System.' Under this system, a certain number of meters will be read each day throughout the month. Bills will be dated the day the meter is read and delivered in from 3 to 5 days thereafter. The discount period will expire 15 days from the date of the bill, and not uniformly on the 10th of each month as at present. The date of the expiration of the discount period will be conspicuously stamped on each bill. The discount period for September bills (delivered to consumers October 1), will expire October 10, as usual. Thereafter, the discount period will expire 15 days from the date of the bill. The bills during the month of October, 1912, while the change is being made, will cover the period from the 17th, 18th, 19th or 20th of September, to the date in October on which the meter is read. In November and thereafter, the bills will cover a period of approximately one month. This change, by distributing the work throughout the entire month, will, we believe, prevent tedious waiting while paying bills. It will also relieve congestion during the discount period, decrease the liability error and enable us to serve our customers promptly.' The previous reduction of 1 cent per 1,000 cubic feet for each 1,000,000 cubic feet of gas used during the calendar year is to be retained in this reduction of the price of gas, so that the price of gas to some of our largest consumers will be 75 cents per 1,000 cubic feet. In regard to the extension to Riverside, the price is that which has been previously filed and will be retained at present as the price of gas on this Riverside extension, namely: $1.35 per 1,000 cubic feet with the usual discount of 10 cents per 1,000 cubic feet, making the net price $1.25 per 1,000. The last clause is for the purpose of making a minimum charge of 50 cents per month for the expense and maintenance of service, meter, etc., and will apply to the consumers who use a very small amount of gas.'"

ARTICLES incorporating the Kentucky Utilities Company were filed in Frankfort, the other day. The corporation's main place of business is returned as Louisville, its capital stock is $2,000,000; its organizers are Messrs. W. R. Watson, Chas. J. Ruebling and L. Earl Powell, of Chicago, and its business is to conduct and maintain all lines of work connected with the operation of electric, gas or water power, lighting or heating plants. The Company is also authorized to manufacture machinery used in the operation of public utility plants, to mine coal or to run street car lines.

AT a recent meeting of the Jonesboro (Ark.) City Council a franchise creating the Jonesboro Gas Company was read twice and placed on the calendar, for prompt action. The promoters are: Mr. W. T. Lane, Cashier of the Bank of Jonesboro; Mr. W. W. Cato, formerly a prominent merchant of Jonesboro, but whose business headquarters are now in Chicago; and Mr. E. E. Randolph, Manager of the Pekin Stave and Lumber Company. The named gentlemen are all active and responsible business men, and they mean to operate a gas plant in the named place. Jonesboro is the Capital of Craighead County, Ark., and is located on the St. Louis-Southwestern Railroad, at a point 67 miles north, northwest of Memphis, Tenn. It is a prominent lumber center, and is noted for its extensive manufacture of heading and boxes. It has a population of 7,800, and affords a certainly profitable field for a gas works, in that its residents have had to put up with an electric current supply that is poor in quality and continuity, and high in respect of charging.

AT a meeting of the Board of Aldermen, Gainesville, Fla., held some days ago, a resolution was adopted directing the Mayor to appoint a committee to be charged with ascertaining the probable cost of a gas plant to be operated on municipal account.

"B. V. W.," writing from Joliet, Ills., under date of August 27th, says that the new gas plant for that section will be ready to operate by the 25th inst.

THE Directors of the Baltimore (Md.) Consolidated Gas, Electric Light and Power Company have declared a regular dividend, for the past half year on the preferred stock, amounting to 3 per cent.; also a quarterly dividend of 1¼ per cent. on the common. Both are payable the 1st prox., to holders of record as of the 20th inst. The annual meeting of the Company will be held the 7th prox.

"B. M. B.," writing from Wichita, Kas., under date of the 24th ult., says that plans have been made by the Kansas Gas and Electric Company for the construction of an office building, warehouse and garage. The structure will be located on Third street, between Sherman and Stevens avenues. The preliminary sketches were drawn by Mr. U. G. Charles, a prominent architect, and those having been accepted he is preparing plans and specifications for submitting to builders. Manager H. S. Sladen says the structure will be of cement blocks, faced with paving brick. The dimension will be 135 feet in length, 50 feet wide and 26 feet in height—provision being made for 2 stories. He also said that this proceeding will enable the housing of all its departments (business, engineering, show room, storage rooms, etc.) under one roof, thus effecting great advances in economy and convenience. Superintendents Miller and Tingley will appreciate the change, which will cost at least $30,000.

A RECENT issue of the Beaumont (Tex.) "Daily Journal" contained a full page, profusely illustrated description of the modern gas plant recently constructed in that magic city. Constructed in 1901, with the idea of supplying natural gas to the people of Beaumont, the Company now owns and operates a modern water gas outfit, part of the sequence being a storage holder up to retaining 200,000 cubic feet. Better than all this record, however, comes the satisfactory knowledge that Beaumont grows rapidly, and that to this growth the Beaumont Gas Company has been of marked assistance.

"WHITE," writing under date of 28th prox., from Chambersburg, Pa., says: "We do not bother 'Old Reliable' very often, although its appearance here each Monday is awaited with expectancy. However, it may not be out of place that I tell you we are in the gas business to some extent; in fact, the output here has doubled in the last 4 years; and that is going some. The Chambersburg Gas Company (which is being managed in the best sort of business way by its proprietors) some weeks ago purchased the plot known as the Elliott property in South Franklin street, for the purpose of erecting a storage holder that will be up to the needs of the Company for 10 years or more. The owners say the latter, but the writer says its capacity will be exceeded within half that period." We are greatly obliged to Mr. White for this information, which is all right as far as it goes, but we are sorry he did not add how large the holder is to be or who is its builder. However, mayhap that will come along later.

"M. V. T.," says that the formal merger of the Woonsocket and Pawtucket (R. I.) lighting companies—four in number—will be ratified at a special meeting to be held this day fortnight. The Stone & Webster organization is in control of the named properties.

Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 20 cents.

1,035,881. Gas Lamp Suspension. J. Keith and G. Keith, London, England.

1,035,892. Gas Cleaner. P. Meehan, Lowellville, O.

1,035,972. Process for the Removal of Carbon Disulphide from Gases. E. Knoevenagel, Heidelberg, Germany, assignor to Athion-Gesellschaft mit beschrankter Haftung, Mannheim-Waldhof, Germany.

1,036,076. Gas Meter Connection. M. A. Corbett, Columbus, O.

1,036,133. Gas Mixer and Regulator. G. W. McKee, Rockford, Ills., assignor to Eclipse Fuel Engineering Co., same place.

1,036,233. Bellows for Dry Gas Meters. G. H. Heeley, Paris, France, assignor to La Compagnie pour La Fabrication des Compteurs et Materiel d'Usines a Gaz, same place.

1,036,266. Regulating and Reversing Apparatus for Regenerating Gas Furnaces. H. Koppers, Mulheim-on-the-Ruhr, Germany.

1,036,361. Prepayment Gas Meter. H. A. Smith, Hopewell, N. J., assignor to the Standard Meter Co., same place.

The Market for Gas Securities.

Weakness of a gentle nature, the manifestation of which was made without violence or ill-doing, was the characteristic respecting the financial condition (in so far as quotations go) of Consolidated during the week. The Wall Street doctors diagnose the case as traceable to indifference; there were no purchasing orders, hence the selling apothecaries took a chance on the short side, on a very small scale, though. The quotations to-day (Friday) are: Bid, 145; offered at 145¼.

Brooklyn Union is steady, although the net result for the week is the loss of ¼ point in the bid price. The B. U. G. Company's subsidiaries keep showing tremendous percentage gains in output. In out-of-town shares the changes to report are very slight. The feature of Canadian securities is the marked increase in Montreal common.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

SEPTEMBER 2.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	145	145¼
Central Union Gas Co.—				
1st 5's, due 1972, J. & J.	8,000,000	1,000	103	106
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	106	108
Mutual Gas Co.	3,500,000	100	182	187
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	101	102½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98½	100½
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	96	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	99¾	101
Standard	5,000,000	100	60	70
Preferred	5,000,000	100	90	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	147½	148
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	999,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	¾	⅛
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,660,000	1,000	104	105¼
Cincinnati Gas and Electric Co.	29,500,000	100	87	90
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90¼	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	13,460,084	—		—
Mortgages, 5's	3,400,000	—		—
General Mortgage 4½	10,661,000	—		—
Con. Gas Co., Baltimore City, 4½	2,751,000	—		—
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	94	96
Bonds	75,000	—	—	100
Detroit City Gas Co.	6,580,000	—	—	50
Detroit Gas Co., 5's	381,000	1,000	75	80
" Prior Lien 5's	5,619,000	1,000	97	100½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	325	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	130	133
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	38	45
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	91	95
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,822,000	1,000	98½	99
Laclede Gas Co., St. Louis.	10,000,000	100	107	107½
Preferred	2,500,006	100	90	100
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	120	130
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	
Massachusetts Gas Companies, of Boston	25,000,000	100	89¾	90
Preferred	25,000,000	100	95½	96
Montreal Gas Co., Canada	2,000,000	100	233	236
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	5,000,000	25	182	190
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	116½	116½
1st Mortgage	20,100,000	1,000	102	102½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104½	105½
Pacific Gas and Electric Co.	15,500,000	—	64	65
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,600,000	200	420	425
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 16 to 18, 1912. Marlborough-Blenheim Hotel, Atlantic City, N. J. Officers: President, Ira C. Copley, Aurora, Ills. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting and Gas Show, Toronto, Aug. 26th to Sept. 7, 1912. Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 9, 1912. Officers: President, R. M. Searle, Rochester, N, Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Gas Meters.—Monthly meetings. Chairman, Will W. Barnes; Commissioners, W. H. Pettes, I. W. Peffly; Secretary, H. Thurston Owens, 42 Pine street, New York City.

Guild of Gas Managers of New England.—Annual meeting, March, 1913. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 19th and 20th, 1913. Chicago, Ills. Officers: President, H. O. Channon, Quincy, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting, Niagara Falls, Canada, Sept. 16-19, 1912. Meetings of Sections, monthly. Pres't, V. R. Lansingh, New York City; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 28 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

Indiana Gas Association.—Annual meeting, March, 1913, Indianapolis. Officers: President, Howard L. Olds, Indianapolis; Vice-President, Wm. Wallace, Lafayette; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, Burlington, Ia., May 22, 23, 24, 1913; Officers: President, C. W. Fair, Atlantic, Ia.; Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October 17-19. Manhattan, Kas. Officers: President, B. F. Eyer, Manhattan, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association.—Annual meeting, September 4-6, 1912; Toronto, Canada. Officers: President, F. W. Blowers, Kalamazoo, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1913; Joplin, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and Gas Show, Dec. 2-5, 1912. Atlanta, Ga. Officers: President, C. L. Holman, St. Louis, Mo.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, Cleveland, O., May, 1913; Officers: President, M. B. Daly, Cleveland, O; Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, ——— 1913. Boston. Officers: President, D. D. Barnum, Worcester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Fall Meeting, Sept. 21, Atlantic City, N. J.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn Belmar, N. J.

Ohio Gas Association.—Annual meeting, February ———, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, May, 1913. President, Noel R. Gascho, Alva, Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting, San Diego, Cal., September 17, 18, 19, 1912. Officers: President, W. Baurhyte, Los Angeles, Cal.; Vice-President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, York, Pa., April, 1913; Officers, President, H. H. Ganser, Norristown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 13, 1912; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, ——— 1913, ——— Officers: President, C. E. White, Montgomery, Ala.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April ——— 1913, Galveston, Tex. Officers: President, F. M. Lege, Jr., Galveston, Tex.; Secretary, H. S. Cooper, 405 Slaughter Bldg., Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May ——— 1913, Milwaukee, Wis. Officers: President, I. F. Wortendyke, Janesville, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.